

***2001 ANNUAL REPORT ON IMPLEMENTATION OF THE
CHESAPEAKE BAY AGREEMENT,
STATUS OF THE TRIBUTARY STRATEGIES,
AND STATUS OF WATER QUALITY FOR
VIRGINIA'S CHESAPEAKE BAY AND TRIBUTARIES***



2001 Report of
The Secretary of Natural Resources

November 2001



COMMONWEALTH of VIRGINIA

Office of the Governor

James S. Gilmore, III
Governor

Ronald P. Hamm
Secretary of Natural Resources

December 20, 2001

Honorable Members of the General Assembly:

It is my pleasure to submit for your review the 2001 Annual Report on the Implementation of the Chesapeake Bay Agreement, Status of the Tributary Strategies and Status of Water Quality for Virginia's Chesapeake Bay and Tributaries. This Report was produced in accordance with Title 2.2, Chapter 2, Sections 220 & 220.1, of the Code of Virginia.

The Gilmore administration was a major participant in drafting the new Bay agreement, *Chesapeake 2000*, and remains fully committed to its implementation. With nearly 60 percent of Virginia's lands draining into the Chesapeake Bay, the evolving implementation of the agreement will continue to have a significant effect on the environment of the Commonwealth and the lives of a very large percentage of its citizens.

In the short term we must at least keep up with the impacts of regional growth and development on the Bay ecosystem. In the long term we must find ways to more aggressively engage both the innovative capabilities of the times and the willingness of our citizens to be more effective stewards in order to meet all of the goals and commitments of the new agreement.

Overall, steady progress is being made in the Chesapeake Bay watershed and its tributary basins to reduce nutrient and sediment loads from both point and nonpoint sources. Significant wastewater facilities are being retrofitted with nutrient reduction systems, and land runoff is being controlled through the implementation of various Best Management Practices on agricultural, forested and urban-suburban lands.

I would like to thank each of you for your leadership and commitment to improving the quality of Virginia's water resources, and commend you in advance for your continuing efforts to meet the challenges that lie ahead. That support will become ever more critical as we move into the next implementation phases. The nutrient and sediment reduction goals we face will become more difficult and complex to achieve as

the Bay Program partners shift their focus from simply reducing annual loads of nutrients and sediment to the much more complex task of meeting water quality restoration objectives keyed to the needs of living resources and their habitats. In addition, the major objective of avoiding the regulatory imposition of Total Maximum Daily Load nutrient and sediment requirements on our tidal rivers, through the removal of those waters from the Impaired Waters list using a cooperative approach, will greatly benefit from the highest levels of administrative and legislative agreement and coordination.

As Virginia moves ahead toward meeting those goals and commitments there are four areas that I think would benefit from special cooperation and coordination between the General Assembly and the new administration.

Stormwater Management

The Commonwealth is committed to lead by example in the area of stormwater management by an agreement signed at the December 3, 2001 Executive Council meeting. The state will implement innovative stormwater management techniques on its own projects to demonstrate leading edge technology and methods. I also believe that Low Impact Development techniques, some of which can be retroactively applied, can reduce the amount and improve the quality of stormwater runoff, and can be a key element in reducing the impact on the Bay from this source of pollution.

Land Preservation

The Commonwealth actively promotes land preservation and itself preserves land in a number of ways. The Virginia Outdoors Foundation is the leading state preservation organization and in 2000 an additional 28,000 acres were preserved with permanent conservation easements. The Virginia Land Conservation Foundation is another important participant in land preservation. By requiring matching funding from grant recipients, the VLCF leverages its funding to far more effect than if it directly funded projects or purchased land itself. In addition to continuing these and related agency activities, the development and use of Low Impact Development techniques such as cluster development by Virginia localities could serve as a significant, efficient, and low cost method of preserving land throughout the state. The state should take the lead in encouraging the use of Low Impact Development to both the private sector and to its localities.

Reduction of Harmful Sprawl

Any development that someone does not like is often labeled as “sprawl” even when that development is in keeping with the Comprehensive Plan and is surrounded by other development. The mere conversion of land to development is not “sprawl” nor is it necessarily “harmful” to the environment. The carefully negotiated *Chesapeake 2000* agreement is specifically aimed at reducing “harmful sprawl” impacts on the water quality of the Bay. Low Impact Development methods have been proven to significantly improve water quality even in developed areas.

The techniques of Low Impact Development, which include a broad range of land use and site plan actions that can be adopted by localities, can have a significant impact on

meeting each of the goals listed above. These techniques improve water quality, reduce development costs, and can result in economic development that is environmentally friendly. The Commonwealth needs to lead the effort to develop, authorize, and promote Low Impact Development in Virginia.

Citizen Stewardship

In the past we have done a respectable job of working with those stakeholders such as local governments, industry, farmers and conservation organizations who were seen as having a direct impact on, or concerted interest in, our water quality. However, with the new commitments of *Chesapeake 2000*, the stakes have been raised. All residents of the Bay watershed have a role to play in improving its water quality. Studies show that most are willing to do their part. Unfortunately very few know of their impacts and the simple steps they can take to lessen them. We must find the resources and develop the strategies to inform our citizens as to the power they hold.

I hope that the information in this Report answers any questions you may have regarding our implementation of the new Bay Agreement and the related development and implementation of our tributary strategies.

Respectfully submitted,

Ronald P. Hamm

***2001 ANNUAL REPORT ON IMPLEMENTATION OF THE
CHESAPEAKE BAY AGREEMENT,
STATUS OF THE TRIBUTARY STRATEGIES,
AND STATUS OF WATER QUALITY FOR
VIRGINIA'S CHESAPEAKE BAY AND TRIBUTARIES***

2001 Report of
The Secretary of Natural Resources
to the

- ◆ House Committee on Chesapeake and its Tributaries
- ◆ Senate Committee on Agriculture, Conservation, and Natural Resources
- ◆ House Committee on Conservation and Natural Resources
- ◆ House Committee on Appropriations
- ◆ Senate Committee on Finance
- ◆ Virginia Delegation to the Chesapeake Bay Commission

Submitted in accordance with
Title 2.2, Chapter 2, Sections 220 & 220.1 of the Code of Virginia

November 2001

*This report was printed with Federal funding from the Chesapeake Bay Program of the
Environmental Protection Agency.*

Table of Contents

Statutory Basis and Format of Report.....	iii
List of State Entities Noted in Report.....	iv

Part One - Implementing the Chesapeake 2000 Agreement

I.	Overview:	
	A. Nature of the Chesapeake Bay Program.....	1
	B. The Three Chesapeake Bay Agreements.....	2
II.	Implementation Opportunities and Challenges:	
	A. Implementation Resources.....	3
	B. Public Awareness.....	5
	C. Public Support for Goals and Funding.....	5
	D. Communication, Consultation and Coordination with Our Virginia Partners.....	6
III.	Local Government Activities Supporting Implementation of the Agreement....	10
IV.	Assessments of Individual Commitments.....	12
	<i>(The numbering in this section of the report follows that used in the CBP for tracking purposes)</i>	
	(1.0) Living Resources Protection and Recreation:	
	(1.1) Oysters.....	15
	(1.2) Exotic Species.....	16
	(1.3) Fish Passage and Migratory and Resident Fish.....	18
	(1.4) Multi-Species Management.....	23
	(1.5) Crabs.....	25
	(2.0) Vital Habitat Protection and Restoration:	
	(2.1) Submerged Aquatic Vegetation.....	27
	(2.2) Watersheds.....	28
	(2.3) Wetlands.....	33
	(2.4) Forests.....	38
	(3.0) Water Quality Protection and Restoration:	
	(3.1) Nutrients and Sediments.....	43
	(3.2) Chemical Contaminants.....	50
	(3.3) Priority Urban Waters.....	53
	(3.4) Air Pollution.....	55
	(3.5) Boat Discharge.....	56
	(4.0) Sound Land Use:	
	(4.1) Land Conservation.....	59

(4.2) Development, Redevelopment and Revitalization.....	66
(4.3) Transportation.....	84
(4.4) Public Access.....	87
(5.0) Stewardship and Community Engagement:	
(5.1) Education and Outreach.....	91
(5.2) Community Engagement.....	98
(5.3) Government by Example.....	104
(5.4) Partnerships.....	106
 Part Two - Virginia's Tributary Strategy Program	
I. Overview:	
A. Background.....	109
B. Tributary Strategy Development.....	109
C. Status and Implementation.....	110
D. Next Steps:.....	110
<i>(Achieving Environmental Endpoints through Goal Reevaluation,</i>	
<i>Strategy Revision and Full Implementation)</i>	
II. Status Reports on Virginia's Tributary Strategies:	
A. Shennandoah-Potomac.....	111
B. Rappahannock River and Northern Neck Coastal Basins.....	113
C. York River and Lower Coastal Basins.....	114
D. James River Basin.....	115
E. Eastern Shore Bay Coastal Tributaries.....	116
 Part Three - Environmental Status and Trends Information	
I. Introduction and Overview.....	119
II. Tributary Basin Nutrient Loads	
A. Point Sources.....	120
B. Nonpoint Sources.....	121
III. Water Quality.....	122
Appendices.....	133
A. The Chesapeake 2000 Bay Agreement	
B. Summary of Resource Information for 22 Subsections of the Agreement	
C. Results of Survey of Local Governments	
D. Background Information Re: Setting Environmental Endpoints	
E. 2000 Point Source Nutrient Load Information	

STATUTORY BASIS AND FORMAT OF THE REPORT

This report is in response to two related statutory requirements, found in the Code of Virginia:

- Title 2.2, Chapter 2, Section 220 - calls for an annual report of progress being made in the development and implementation of nutrient reduction strategies for Virginia's tributaries to the Chesapeake Bay. This is the sixth annual report prepared in response to this code requirement.
- Title 2.2, Chapter 2, Section 220.1 - calls for an annual report on the progress being made by the Commonwealth in achieving a 40% reduction of nutrients into the Bay and its tributaries, and on the status of all of Virginia's commitments under the new Chesapeake Bay agreement (*Chesapeake 2000*), signed in June 2000. The initial report on progress was made last year in response to language in the Appropriations Act. In 2001 the Code was modified to add that requirement as well.

Part One of this Report describes the context and implementation of Virginia's implementation of the new Bay agreement. Part Two describes the evolving implementation of nutrient and sediment reduction strategies for Virginia's Chesapeake Bay tributaries. Part Three describes the key environmental status and trends information for Virginia's Chesapeake Bay and tidal tributaries.

LIST OF STATE ENTITIES NOTED IN REPORT

Throughout this Report abbreviations are frequently used in place of the full names of Virginia state entities (agencies, institutions, foundations, etc.). This has been done to save space and to make the report more readable. This list of state entities noted in the Report is provided at the beginning of the Report so as to remind the reader of those abbreviations and to serve as an easily located reference. In Part One most of the assessments of the individual commitments contain a list of participating state entities. Those lists are in alphabetical order and are not meant to indicate relative roles in the implementation of a given commitment.

<u>Abbreviation</u>	<u>Name of State Entity</u>
CBLAD	Chesapeake Bay Local Assistance Department
DCR	Department of Conservation and Recreation
DEQ	Department of Environmental Quality
DGIF	Department of Game and Inland Fisheries
DGS	Department of General Services
DHCD	Department of Housing & Community Development
DHR	Department of Historic Resources
DMME	Department of Mines, Minerals & Energy
DOE	Department of Education
DOC	Department of Corrections
DOF	Department of Forestry
MRC	Marine Resources Commission
ODU	Old Dominion University
SCC	State Corporation Commission
SMV	Science Museum of Virginia
TAX	Department of Taxation
VCE	Virginia Cooperative Extension
VCU	Virginia Commonwealth University
VDACS	Department of Agriculture & Consumer Services
VDH	Virginia Department of Health
VDOT	Virginia Department of Transportation
VHDA	Virginia Housing Development Authority
VIMS	Virginia Institute of Marine Science
VCLF	Virginia Land Conservation Foundation
VMNH	Virginia Museum of Natural History
VOF	Virginia Outdoors Foundation
VPA	Virginia Port Authority
VPISU	Virginia Polytechnic Institute & State University
VRA	Virginia Resources Authority

PART ONE

Implementing the Chesapeake 2000 Agreement

I. Overview

On June 28, 2000 the governors of Virginia, Maryland, and Pennsylvania, the mayor of the District of Columbia, the chairman of the three-state legislative Chesapeake Bay Commission and the administrator of the U.S. Environmental Protection Agency - the Chesapeake Executive Council - signed an ambitious new document developed to guide future efforts to protect and restore the Chesapeake Bay and its rivers. This part of the annual report provides an overview of the implementation of that new Chesapeake Bay Agreement - *Chesapeake 2000: A Watershed Partnership*.

Part One of the annual report consists of the following elements:

- This overview,
- (I) A section on implementation opportunities and challenges,
- (II) An overview of some initial information on local government activities that contribute to the implementation of the agreement, and
- (III) Assessments of the individual commitments found in the agreement

There are 105 distinct tasks found in the commitments of the 22 subsections of the 5 main sections of the agreement. The assessments of those tasks constitute the bulk of this part of the annual report. A number of the assessments combine several of the tasks. Those assessments are found in section III of this part of the report.

A. Nature of the Chesapeake Bay Program

The Chesapeake Bay Program (CBP) is a cooperative arrangement for addressing the protection and restoration of the water quality, habitats and living resources of the Chesapeake Bay and its tributaries. The CBP functions as a forum for developing consensus on system-wide problems that can benefit from cooperative goal setting and associated technical and scientific efforts. The principal policy making forum within the CBP is the Executive Council.

Each signatory state determines how it will meet the various commitments, and the approaches to individual commitments often vary greatly among the states. An important basic fact, often misunderstood by many, is that the commitments adopted by the Executive Council are not legally binding. Each commitment is a statement that the signatories will do their best to accomplish a given task, often by a specified time and often in terms of a specific numerical goal. However, in some cases the initiatives and commitments do have an underpinning in law or regulation but the CBP often seeks to go beyond the minimum requirements of those mandates and also involve the non-regulated community.

The Executive Council of the CBP sets ambitious goals. When a cooperative effort such as the CBP reaches high it sometimes misses the mark, at least for a time.

Missing goal dates and associated milestones is not taken lightly and is avoided wherever possible. In a cooperative effort such as the CBP, however, goal dates are self-imposed and are a guide and a motivation rather than an absolute deadline.

While all of the above is a necessary context for understanding the commitments and their implementation, it is equally important that everyone also understand that the Commonwealth is firmly committed to the long-term success of the Chesapeake Bay Program and to the accomplishment of all of the commitments of *Chesapeake 2000*.

B. The Three Chesapeake Bay Agreements

The current Agreement is the third in a series of ongoing Agreements designed to guide the cooperative approach to the protection and restoration of the Chesapeake Bay's aquatic system and its watershed. Each clearly reflects an evolutionary phase in this unique cooperative regional program.

The first Agreement, signed in 1983, consisted of two paragraphs and simply stated that the signatories would work together toward the restoration and protection of the Bay system. The focus at that time was almost entirely on the main Bay as a receiver of pollutants, a major habitat shared by many species, and as influenced by many jurisdictions.

Once the Program made the transition from research (prior to 1983) to implementation, it necessarily became steadily more complex. The 1987 Agreement gave formal direction to that emerging complexity and was notable not only for its breadth but also for the establishment of a numerical nutrient reduction goal. This goal became the single most important driving force in the Program. Both the phosphorus and nitrogen reduction goals are close to attainment. If those goals had not been set in 1987, it is highly unlikely that any of the signatory states would be anywhere near their marks.

The new Agreement – *Chesapeake 2000: A Watershed Partnership* – builds on the 1987 Agreement and once again pushes the limit of what we think is necessary and possible to attain. This new Agreement is especially complicated by the direct linkage to one aspect of the federal Clean Water Act, that of Total Maximum Daily Loads, or TMDLs. The approach adopted in the Agreement, when successful, will eliminate the need to establish TMDLs for the Bay and the estuarine portions of its tributaries. By moving ahead in a cooperative manner, the signatory states can meet the intent of the Clean Water Act and retain the kind of management flexibility they consider most useful. The 2000 Agreement also moves into major new areas with the addition of a large number of related commitments that are directed toward minimizing the negative effects of regional growth and development.

II. Implementation Opportunities and Challenges

Chesapeake 2000 is an extraordinarily ambitious cooperative agreement and the task of achieving its many commitments has moved the Chesapeake Bay Program to a new level of complexity and difficulty. In the array of implementation opportunities and challenges facing the new agreement there are three that are noted here; implementation resources, public awareness and support, and communication, consultation and cooperation with our Virginia partners.

A. Implementation Resources

Detailed estimates of the amount of resources that would be necessary to achieve all of the numerous commitments through to 2010 are still being developed in a variety of ways. However, initial estimates clearly show that the sums that will be needed are on an order of magnitude seldom considered in the past. The development of complete estimates at that scale will include counting the possible efforts by all relevant sources; federal, state, local, private sector, non-government organizations, and individual citizens. At this point some limited agreement-related data on state resources is available. No attempt has been made at this point to estimate necessary local government, private sector and citizen contributions to implementing the agreement through 2010.

Varying degrees of information currently are available on the allocation of resources through state agencies and the needs of state agencies relative to the implementation of *Chesapeake 2000*. Table I-1, following this section on resources, summarizes that information for the five sections of the agreement, and the table in Appendix B summarizes it for the twenty-two subsections of the agreement.

Data has been assembled on agreement-related resources allocated through Virginia state agencies and institutions for the 2001-2002 biennium budget. Those data clearly show that very significant amounts of general and non-general (largely federal) monies have been and are being directed toward *Chesapeake 2000* activities.

Agreement-related data from the 2003-2004 biennium budget proposals of participating state agencies and institutions are also shown in both tables. Those data only show additional dollars and FTEs that have been requested over the 2002-2003 base funding proposed for each entity. Because of the current and expected short and near-term revenue generation and budget surplus limitations very few requests for additional resources have been included in this table.

Anticipating a more positive budgetary environment in future years the participating agencies and institutions have been asked to develop initial rough estimates of the additional resources above base funding that would be needed to fully implement the agreement through the period 2005-2010. Those estimates include non-general funds (federal and other) to be used by the agencies and/or passed through to local governments and others.

Table I-1
Appropriations and Future Anticipated Costs for
Five Major Sections of the Chesapeake Bay Commitments

Section Number	FY01 FTE Positions	FY01 General Fund Appropriations	FY01 Non-General Fund Appropriations from Federal Sources	FY01 Non-General Fund Appropriations from Other (Nonfederal) Sources	FY02 FTE Positions	FY02 General Fund Appropriations	FY02 Non-General Fund Appropriations from Federal Sources	FY02 Non-General Fund Appropriations from Other (NonFederal) Sources	Additional FTE Requested for the 03-04 Biennium (Based on Budget Decision Packages)	Additional General Funds Requested for the 03-04 Biennium (Based on Budget Decision Packages)	Total Additional General Funds Needed for 2005 to 2010 Period (Low Estimate)	Total Additional General Funds Needed for 2005 to 2010 Period (High Estimate)
1.0	52.75	\$3,019,151	\$2,048,028	\$3,158,540	53.75	\$2,849,695	\$4,542,488	\$3,229,198	1.00	\$1,685,475	\$13,329,000	\$13,588,000
2.0	238.63	\$22,685,730	\$1,357,994	\$5,182,527	239.13	\$19,781,047	\$1,362,389	\$5,364,493	0.00	\$10,707,851	\$9,611,000	\$61,465,000
3.0	131.75	\$42,052,780	\$6,458,553	\$1,379,369	131.75	\$30,177,063	\$6,614,246	\$379,472	3.00	\$2,589,360	\$126,376,000	\$2,768,887,000
4.0	238.77	\$20,818,583	\$28,066,450	\$2,334,892	239.17	\$14,310,860	\$27,672,550	\$2,573,686	8.50	\$1,216,920	\$62,766,000	\$247,765,000
5.0	85.33	\$21,645,093	\$1,006,081	\$756,040	84.93	\$22,368,543	\$1,023,664	\$757,508	1.00	\$764,694	\$10,180,000	\$46,519,000
VIMS	355.12	\$17,528,761	\$8,316,603	\$4,731,802	359.12	\$17,898,275	\$8,316,603	\$4,732,447	30.00	\$4,914,206	\$0	\$0
Grand Total	1,102.35	\$127,750,098	\$47,253,709	\$17,543,170	1,107.85	\$107,385,483	\$49,531,940	\$17,036,804	43.50	\$21,878,506	\$222,262,000	\$3,138,224,000

Note: Information for VDOT by the five sections is included for FY01 and FY02 related columns only

Note: Information for VIMS is included as a separate line item for FY02 through FY04 related columns only

Note: Includes DCR, DEQ, DOF, DGIF, VMRC, and CBLAD

B. Public Awareness

Over the past 17 years, the Bay Program has been successful reaching out to stakeholders through various innovative programs and activities. As a result of these efforts there are specific groups of stakeholders who are very involved in Bay related issues and discussions.

However, the expanded commitments of Chesapeake 2000 have raised the stakes. The public's awareness of their role in improving water quality must be greatly increased if these new commitments are to be met. In order to repeat that same level of success with the general public, the program needs to develop and expand new vehicles, such as mass media advertisements, to engage the public as a whole. Currently the program is taking a three pronged approach:

1. Formal Education – A meaningful Bay experience

Virginia and the other jurisdictions are working to ensure that each school student participates in a meaningful outdoor water quality related experience before graduation from high school. The agreement calls for this to be in place for the class of 2005. Working through the Communications and Education Subcommittee's Education Workgroup, the jurisdictions have agreed that this "experience" should be integrated into the overall curriculum rather than being an isolated occurrence. Each is now developing implementation plans.

2. Lifelong Education – Reaching out to the Public

To make education and public outreach a priority, the Bay Program is recognizing that new messages and new vehicles for those messages need to be developed to reach the citizens of the watershed. The program has commissioned a watershed-wide public attitudes and perceptions survey to be completed in June 2002. The results of this work will then be used to identify key audiences, appropriate messages for those audiences and the most effective ways of sharing those messages. The program is also exploring ways to develop a mass media marketing approach to reaching the public beginning in 2003.

3. Community Watershed Organizations – A grassroots approach

The Bay Program is also working to provide tools to existing watershed based organizations and to assist interested citizens in forming new local watershed advocacy groups. This grassroots approach of working through the state partners to reach organized citizens will assist in watershed planning throughout the basin. These community watershed efforts will also be strengthened as the program's outreach efforts make the general public more aware of their impacts on local water quality issues. In Virginia a related development in the ongoing effort to communicate with and engage citizens, interest groups and others at the local level has been the creation of watershed roundtables or forums and, in one case, a river basin commission. These are discussed in D below.

C. Public Support for Goals and Funding

Large scale but narrowly focused environmental efforts usually have one or two clearly defined and easily understood goals that can readily be linked to specific funding needs.

Large-scale complex environmental efforts such as the Chesapeake Bay Program, however, present a very different set of problems in terms of support for their goals and associated funding. A large number of citizens are very favorably disposed toward the general concept of restoring the Chesapeake Bay, its tributaries and living resources but have little specific knowledge of what it will take to accomplish that broad end. This is entirely understandable given the matters competing for the attention of most individuals on a daily basis. Consequently, there is a major gap between general support for the restoration of the Bay system and support for the specific commitments and funding necessary to achieve those commitments.

As noted above one of the most successful approaches to long-term, effective public support which the state can help foster seems to lie in creating and building on individual, group and community support at the local level - at the level of a local stream, or river reach, or small watershed. Even if an individual, group or community is only thinking in local terms the informed concentration of efforts at that level can only benefit the larger, regional effort. Further, local interest provides the opportunity for the development of coordinated and sustained bottom-up support for specific state legislative and administrative actions. Coupled with efforts to inform and engage the general public as well as specific target groups, such as developers and farmers, the growing emphasis on local actions and groups is certain to lead us to sustained support for the overall restoration effort.

D. Communication, Consultation and Coordination with Our Virginia Partners

The Chesapeake Bay 2000 Agreement commitments require an unprecedented level of communication, consultation and coordination among federal, state and local governments as well as community and watershed organizations. These interactions relative to the 2000 agreement are well established between state and federal agencies. However, effective and sustainable linkages with local governments and other organizations within a regional perspective are still emerging. In addition to the state and federal linkages, many effective state agency relationships exist with individual local governments relative to specific agency programs. Further, the Virginia Association of Counties and the Virginia Municipal League provide linkages amongst localities statewide. All of these relationships, while effective in their intended purpose, do not currently address the need for more extensive and effective watershed level communication, consultation and coordination.

The existing regional linkages, in place bay-wide, that support Bay agreement related local involvement include planning district commissions, watershed conservation roundtables, soil and water conservation districts, and, in one part of the Virginia Bay watershed, a river basin commission. These regional entities, depending on location and level of involvement, are performing a variety of communication, consultation and coordination activities, some collectively and others individually.

Both the bay-wide and regional/watershed-wide linkages are critical to the effective implementation of the *Chesapeake 2000* agreement. The following is an overview of these entities and the current roles:

1. Bay-wide Coordination:

Virginia Secretary of Natural Resources – The Office of the Secretary oversees the state agencies within its purview to ensure that coordination of resources and programs is achieved. This is performed through direct interaction of the Agency heads on the full spectrum of natural resource issues.

Virginia Watershed Planning and Permitting Task Force The task force is composed of the Directors, or their designees, of the DEQ, DCR, DOF, DMME, CBLAD, and the Commissioner, or his designee, of DACS. "The task force shall undertake such measures and activities it deems necessary and appropriate to see that the functions of the agencies represented therein, and to the extent practicable of other agencies of the Commonwealth, and the efforts of state and local agencies and authorities in watershed planning and watershed permitting are coordinated and promoted." (§ 10.1-1194)

Nonpoint Source Advisory Committee

This committee was formed in the 1980's to bring a coordinated approach to nonpoint source pollution control programs statewide. It is chaired by DCR, which is the Virginia's lead NPS agency. A variety of state and federal agencies participate on the committee, all of which have significant nonpoint source water quality responsibilities. These members include the DEQ, MRC, DGIF, DOF, DACS, CBLAD, VDOT, VCES, USDA Natural Resources Conservation Service, and the US Geological Survey. The Committee guides the implementation of the Virginia's Nonpoint Source Management Program, a strategy required under the Clean Water Act to help assure states give a high priority to the water quality problems resulting from runoff and other diffuse sources. Through NPSAC meetings and grant review functions, its state and federal agency members pursue partnerships with other groups and organizations working to prevent nonpoint source pollution.

Virginia Chesapeake Bay Interagency Workgroup This workgroup is composed of technical and managerial level members of the critical state agencies participating in the implementation of the C2K agreement. It is further supported by intra-agency workgroups established by the agencies as needed.

Virginia Association of Counties (VACo) and Virginia Municipal League (VML)

VACo and VML are associations of the cities, towns and counties of the Commonwealth for the purpose of fostering a wide range of communication and coordination amongst the local jurisdictions. Both entities engage in local government representation, advocacy and education. One of the many areas of interest to these associations is the Chesapeake Bay Program. Consequently, both VACo and VML are engaged in the process in the above referenced arenas.

2. Regional Coordination

Planning District Commissions. These are legally constituted under the Regional Cooperation Act as political subdivisions and formally established by the local governments in defined areas. Twenty-one (21) PDCs have been established and have been in operation for thirty (30) years or more. Approximately 14 PDCs are wholly within the Chesapeake Bay watershed. These regional entities are formed and operate within political boundaries. PDCs function to inform and receive collective input from local governments and transfer information. Specifically, PDC statutory duties include:

- Conduct studies on issues and problems of regional significance.
- Identify and study potential opportunities for state and local cost saving...through coordinated government efforts.
- Identify mechanisms for the coordination of state and local interests.
- Serve as liaison between localities and state agencies.
- Conduct strategic planning for the region.
- Develop regional functional area plans.
- Assist state agencies, as requested, in the development of sub-state plans.

All of these PDC duties are supportive of and consistent with finding ways to realistically address the major dependence of the *Chesapeake 2000* agreement on local governments for the successful long-term implementation of the that agreement.

Watershed Conservation Roundtables. Established under the Water Quality Improvement Act, Nonpoint Source Cooperative Programs have been underway since early 1999. These are voluntary groups of stakeholders bringing together local governments, community and watershed organizations, and other community interests to discuss and address watershed stewardship issues. The primary role of roundtables at this point is to provide advice to State agencies and to increase coordination among the active stakeholders on watershed based initiatives. Roundtables, while authorized under the WQIA, are not legally constituted and consequently are not afforded distinct functions beyond their advisory role.

Roundtables are intended to encourage and promote nonpoint source pollution control and prevention for the: (1) protection of public drinking water supplies; (2) promotion of water resource conservation; (3) protection of existing high quality state waters and restoration of all other state waters to a condition or quality that will permit all reasonable beneficial uses and will support the propagation and growth of all aquatic life, including finfish and shellfish; (4) protection of all state waters from non point source pollution; (5) prevention of any increase in non point source pollution; (6) reduction of existing non point source pollution; (7) attainment and maintenance of water quality standards; and (8) attainment of commitments made by the Commonwealth to water quality restoration, protection and enhancement, in order to provide for the health, safety and welfare of the present and future citizens of the Commonwealth. These entities are formed and operate within physical watershed boundaries.

The current role for watershed conservation roundtables includes the following:

- Provide a watershed-based forum for stakeholders to participate in defining critical watershed needs, targeting problems for solutions, and providing input on potential management options.
- Identify comprehensive watershed goals and needs.
- Develop and support the implementation of management options and strategic actions.
- Assist in monitoring the success of the strategic actions.
- Conduct public outreach.
- Support the coordination of all efforts conducted to achieve the purposes listed above, with all other efforts conducted to restore and maintain the economic and environmental resources of state and interstate water resources.

Soil and Water Conservation Districts. Virginia is covered by 47 soil and water conservation districts, of which 28 are wholly or in part within the Bay watershed. The responsibilities of soil and water conservation districts (SWCDs) are broad and far reaching. These responsibilities are focused on providing for the conservation of soil and water resources, control and prevention of soil erosion, flood water and sediment damages so as to preserve the natural resources of the Commonwealth.

River Basin Commissions

At this point there are two legislatively created river basins commissions in Virginia; one in the Roanoke River basin and one in the Rappahannock River basin. The Rappahannock River Basin Commission was established in 1998. The purpose and mission of the commission is to provide guidance for the stewardship and enhancement of the water quality and natural resources of the Rappahannock River Basin. The commission is intended to be a forum for local governments and citizens to discuss issues affecting the Basin's water quality and quantity and other natural resources. Through promoting communication, coordination and education, and by suggesting appropriate solutions to identified problems, the commission is to promote activities by local, state and federal governments, and by individuals, that foster resource stewardship for the environmental and economic health of the Basin.

3. Communication, Consultation and Coordination Networks

The organizations noted above currently serve as conduits for communication, consultation and coordination efforts by state agencies, local governments and other organizations. However, a more streamlined approach to linking these organizations within the Chesapeake 2000 context may be necessary to ensure long-term success of the agreement and other environmental and resource enhancement efforts. Developing long-term sustainability of these interwoven efforts necessarily is an evolving and dynamic process.

Historically, the use of PDCs and SWCDs for these activities has been limited in scope of engagement due to their niche audience. Consequently the development of watershed conservation roundtables was intended to address the bay-wide gaps of stakeholder

involvement. Specifically they are intended to increase coordination and communication between PDCs, local governments, SWCDs and conservation organizations on a watershed basis. Further, the roundtables were designed to provide a mechanism through which all these critical stakeholders could provide collective input to the Commonwealth on issues where the watershed perspective is critical to successful management.

In addition to the watershed roundtables, further analysis of the utility of the river basin commission concept as well as the possibilities of expanding the roles of the PDCs will provide insight into how those mechanisms can further communication, consultation and coordination within watersheds.

Where there is active coordination of these organizations, effective communication, consultation and coordination is currently being achieved. However, within several basins, multiple organizations with overlapping water quality responsibilities currently exist resulting in some confusion and coordination challenges. This proves to be an impediment to both state agencies and the citizens in that they have to maintain working relationships with multiple entities to assure desired results. In order to address this problem the Commonwealth will continue to find ways to improve the communication, consultation and coordination capacities within each watershed. This action will help to ensure long-term watershed-focused interaction, minimize duplication of efforts, and enhance viable organizations that already exist. This effort should seek to use and or modify existing pathways of communication in lieu of creating a new layer or entity.

III. Local Government Activities Supporting Implementation of the Agreement

Local governments obviously have a key role in the implementation of the Chesapeake 2000 Bay agreement, as they do for most other significant environmental enhancement efforts. Legislators and other informed persons generally are aware of the range of activities currently carried out by local governments. The following is a list of those routine activities that contribute directly to implementation of the Bay agreement.

- Meeting the provisions of the Chesapeake Bay Preservation Act where applicable
- Meeting the provisions of the State Erosion and Sediment Control Act
- Meeting DEQ permit requirements such as complying with sewage treatment plant effluent limitations and other regulated discharges
- Complying with Safe Drinking Water Act provisions
- Meeting provisions of the Virginia wetlands programs
- Carrying out floodplain management
- Adopting and implementing stormwater management measures
- Conducting activities through the local Soil and Water Conservation Districts

Local Governments and Implementation of *Chesapeake 2000*
Survey Results as of November 1, 2001

In July 2001, a survey was sent to each of the counties and cities with area in the Chesapeake Bay watershed, 193 in all. The survey asked the locality to reply to questions regarding their involvement in each of the commitments contained in the Chesapeake 2000 Agreement. Localities could respond, with regard to each commitment, that it covered activities that they (a) Already had in place, (b) Do not have in place, or (c) Expect to put in place or to expand. The intention (c) to develop or increase the certain activities could compliment both of the first two answer-options. One hundred and four survey-responses (104, or 54%) were counted; several more came in well after the deadline so they have not been included in the following results but will be analyzed for program-development purposes.

The results of the survey are shown in Appendix C. The exercise of surveying the localities provides a rudimentary glance of local governments' status with regard to the *Chesapeake Bay 2000* agreement which, unlike any other, so deeply calls upon local jurisdictions for its implementation. Clearly a new frontier in Chesapeake Bay water quality has been staked out, involving intense, local attention to land use issues. It will take years to explore this new horizon, and to implement effectively. It can start with better analysis of local government participation on an individual-locality basis, using the survey. The state is working to further evaluate the ways in which the implementation of the *Chesapeake 2000* agreement will affect local governments, and to test ways to enhance local/state communications for the implementation of Chesapeake Bay Program commitments. The results of the survey also can be used to indicate issues and areas needing less or more attention, once it is established which commitments Virginia wishes to give the greatest emphasis.

The results show that local governments do not have in place programs or activities to address most of the *Chesapeake 2000* commitments. Of 51 possible commitments cited, there are 35 commitments for which most respondents indicate no programs are in place. In contrast, there are 6 commitments for which the majority of localities do have programs in place. Those 6 are listed below.

(C2K Commitments Most Governments Already Have in Place)

- Programs to encourage the concentration of new development in areas supported by adequate water resources and infrastructure.
- Improved coordination of transportation and land use planning to encourage compact mixed use development patterns and revitalization.
- Programs and policies to ensure that local government properties are operated in a manner consistent with Bay objectives, to include the use of clean fuels, implementation of stormwater management, and sensitive site measures.
- Programs containing nutrient and sediment reduction measures.
- Engagement in watershed management activities
- Incorporation of wetlands preservation goals and policies into existing planning documents.

There are two more commitments which many (over 40 but not a majority) local governments are addressing already.

- Outreach to the development community on sound land use practices
- Programs to promote designs that limit impervious cover or reduce the impacts of impervious cover.

(Commitments with Highest Intent to Begin or expand)

The survey asked whether each locality intended to begin or to expand activities associated with each C2K commitment. Those with the highest response rate are listed below.

- Use of GIS to track land conservation and preservation efforts (33 local governments intend to begin or expand, where an additional 25 already have in place)
- Programs to implement the watershed Tributary Strategy (23, where an additional 34 already have in place)
- Programs to expand the use of easements, purchase of development rights, or other approaches to protect and preserve natural resource lands (22 where an additional 11 already have in place)
- Development of a greenway plan, including conservation easements, greenways and other land conservation mechanisms (22, where an additional 21 already have in place)
- Use of emerging urban stormwater retrofit practices (21, where an additional 14 already have in place)

A space was provided on the survey for comments, and many local governments highlighted their special Chesapeake Bay and watershed management efforts. These responses will be used in following up with local governments to continue supporting their participation in *Chesapeake 2000* related activities and programs.

IV. Assessments of Individual Commitments

Each of the numerous commitments in the Chesapeake 2000 agreement is the subject of an individual assessment. Those assessments are the product of a collaborative effort by the state agencies and institutions that are directly participating in the implementation of the agreement. Each assessment has four elements: *Approach to Implementation of the Commitment*, *Role of the State*, *Progress and Outlook*, and *Additional Efforts Required*. In the *Additional Efforts Required* element the rule has been to deal with this in general terms such as "local governments will require more technical assistance in order to be able to address this commitment". Individual agency estimates of future needs were provided to the Commission on the Future of Virginia's Environment and are available on request.

The numbering system used here to identify the individual commitments, and sometimes their components, is not found in the agreement but was subsequently adopted to allow some degree of consistency and precision in tracking the individual commitments. (Note:

Appendix A contains the full text of the *Chesapeake 2000* agreement.) The numbered sections and subsections of the *Chesapeake 2000* agreement are as follows:

- (1.0) Living Resources Protection and Restoration
 - (1.1) Oysters
 - (1.2) Exotic Species
 - (1.3) Fish Passage and Migratory and Resident Fish
 - (1.4) Multi-species Management
 - (1.5) Crabs
- (2.0) Vital Habitat Protection and Restoration
 - (2.1) Submerged Aquatic Vegetation
 - (2.2) Watersheds
 - (2.3) Wetlands
 - (2.4) Forests
- (3.0) Water Quality Protection and Restoration
 - (3.1) Nutrients and Sediments
 - (3.2) Chemical Contaminants
 - (3.3) Priority Urban Waters
 - (3.4) Air Pollution
 - (3.5) Boat Discharge
- (4.0) Sound Land Use
 - (4.1) Land Conservation
 - (4.2) Development, Redevelopment and Revitalization
 - (4.3) Transportation
 - (4.4) Public Access
- (5.0) Stewardship and Community Engagement
 - (5.1) Education and Outreach
 - (5.2) Community Engagement
 - (5.3) Government by Example
 - (5.4) Partnerships

SECTION 1.0 LIVING RESOURCE PROTECTION AND RESTORATION

SECTION GOAL:

Restore, enhance and protect the finfish, shellfish and other living resources, their habitats and ecological relationships to sustain all fisheries and provide for a balanced ecosystem.

1.1 Oysters

1.1.1 *By 2010, achieve at a minimum, a ten-fold increase in native oysters in the Chesapeake Bay, based upon a 1994 baseline.*

Approach to Implementation of the Commitment

There is currently consensus on a Baywide strategy for oyster restoration involving 10% of the available oyster grounds being dedicated and restored for oyster sanctuaries (primarily 3-dimensional reefs), and the remainder restored for oyster production. The effort in Virginia primarily involves habitat restoration with shell; however, there are important elements that involve aquaculture, disease research, management strategies, and oyster stock monitoring.

Role of the State

State government participants include: DEQ, MRC and VIMS

This is a Baywide commitment, with many State, federal, and private partners committing to the effort.

Progress and Outlook

Significant progress in oyster restoration continued in 2001, especially with increased funding from partnerships, such as the Virginia Oyster Heritage Program. Federal partners including the Army Corps of Engineers, NOAA, and EPA increased funding levels for oyster restoration. There have also been significant contributions from other state and private sources. The 10-year goal for a 10-fold increase in oyster populations is ambitious and will depend on continuous funding and dependable, and reasonably priced sources of oyster reef building and cultch materials. Fossil shell will be dredged in Virginia in 2001, and alternative sources of cultch are being tested. Management strategies currently being implemented appear to be increasing oyster population numbers, but weather and disease will still effect short term and local population levels. There have been significant increases in oyster populations resulting from citizen aquacultural efforts, and this should continue. Progress continues to be made on state research on oyster disease and genetics, and in management and stock assessment evaluations.

Additional Efforts

Federal funding opportunities are expected to continue, but require significant non-federal match. At least 150 acres of harvest area and 10 sanctuary reefs will be required

per year to meet the commitment. Dependable and reasonably priced sources of oyster reef building and cultch materials must be located for the restoration efforts to continue.

1.1.2 *By 2002, develop and implement a strategy to achieve this increase by using sanctuaries sufficient in size and distribution, aquaculture, continued disease research, and disease-resistant management strategies, and other management approaches.*

Approach to Implementation of the Commitment:

There is currently general consensus on the Baywide oyster restoration strategy, but implementation will be somewhat different between Maryland and Virginia. All partners are currently working to write, edit, and review this strategy.

Role of the State

State government participants include: DEQ, MRC and VIMS

This is a Baywide effort, with state taking a coordinated approach to the development of this implementation strategy.

Progress and Outlook

It is anticipated that the implementation strategy will be completed in late 2001 or early 2002.

Additional Efforts

None.

1.2 Exotic Species

1.2.1 *In 2000, establish a Chesapeake Bay Program Task Force to:*

- 1. *Work cooperatively with the U.S. Coast Guard, the ports, the shipping industry, environmental interests and others at the national level to help establish and implement a national program designed to substantially reduce and, where possible, eliminate the introduction of non-native species, and,***
- 2. *By 2002, develop and implement an interim voluntary ballast water management program for the waters of the Bay and its tributaries.***

Approach to Implementation of the Commitment

A representative Chesapeake Bay Program Task Force has been established and has been working on this commitment for some time. The efforts of the Task Force follow the two related components of the commitment: the national approach and the regional approach.

The Bay agreement signatories, the Coast Guard, EPA, NOAA, regional environmental groups, etc. are also represented on the Task Force

Role of the State

The Virginia shipping community, the Virginia Port Authority, VIMS and MRC are represented on the Task Force.

Progress and Outlook

On the national level the Task Force has reviewed and made recommendations regarding the reauthorization of the National Invasive Species Act of 1996 and the National Ballast Management Program. Informal discussions continue in various ways.

On the regional level a ballast water symposium is to be held in the Spring of 2002. The purpose of that symposium is to consider what should be included in an interim voluntary regional ballast water management program. The work of that symposium will form the starting point for the development of the interim program.

The Virginia Marine Resources Commission has adopted state ballast water guidelines that include methods to reduce the discharge of ballast water in state waters. Additionally, mandatory reporting of ballast water control efforts by individual ships entering Virginia waters is now required.

Additional Efforts

None identified at this time.

1.2.2 *By June 2002, the goal of the Chesapeake Bay Invasive Species Workgroup is to identify and rank, non-native, invasive aquatic and terrestrial species, which are causing or have the potential to cause significant negative impacts to the Bay's ecosystem, and to develop statewide and regional management plans for these species.*

Approach to Implementation of Commitment

DGIF coordinates Virginia's efforts through the Invasive Species Workgroup (ISWG). Periodic meetings are held to discuss the status and management of invasive species in Virginia.

Role of the State

State government participants include: DCR, DGIF, VDACS, and VCU

Representatives from state agencies and universities developed a preliminary draft list of the existing top and future top five invasive species in Virginia. The Nature Conservancy is also providing input, especially in the coastal plain areas of Virginia. The participants also discussed ranking criteria which included potential impacts (ecological, economic), distribution (current, projected), and status (abundance, invasiveness), and the development of an internal species ranking system. Species being considered for ranking in Virginia include phragmites, purple loosestrife, hydrilla, Asian clam, blue catfish,

flathead catfish, resident Canada geese, nutria, and future species include zebra mussel, veined rapa whelk, Asian swamp eel, grass carp, mute swan, West Nile virus, and giant salvinia (alga). Note: DCR has an existing internal ranking system in response to seed trade companies that have challenged its botanical invasive species list.

Progress and Outlook

The CBP's ISWG has put forward its recommendations for internal CBP review, discussion and approval. In addition, management plans will be developed for the top two species from each state which are deemed the most problematic to the restoration and integrity of the Bay's ecosystem. Emergency plans will also be developed for species that are not covered under existing management plans to deal with critical situations. Development of a formal invasive species workgroup in Virginia may be underway, which may lead to the development of specific regulations. The workgroup will consist of representatives from state agencies and universities, and technical advisory committees may also be formed.

Additional Efforts

By 2002, the statewide management plans will be modified to cover the entire Bay watershed and opportunities will be explored to develop a Mid-Atlantic Aquatic Nuisance Species Panel.

1.3 Fish Passage and Migratory and Resident Fish

1.3.1 By June 2002, identify the final initiatives necessary to achieve our existing goal of restoring fish passage for migratory fish to more than 1,357 miles of currently blocked river habitat by 2003 and establish a monitoring program to assess the outcomes.

Approach to Implementation of the Commitment

The state takes a coordinated approach to its participation on the Fish Passage Task Group of the CBP's Non-tidal Habitat Workgroup. The state maintains a statewide fish passage impediment database that aids in the site selection process. Priorities are determined by selecting those projects that will provide the greatest benefits to the resident and migratory fish stocks, while maximizing habitat restoration. A GIS coverage of anadromous fish spawning and nursery areas and migration routes is being developed for major watersheds through federal/state interagency review of the data layers initially created by the state. Recently, the state completed a working GIS tool for the Rappahannock River Basin using state and federal data layers. GIS tools will continue to be used in the site selection process.

The state monitors the Boshers Dam fishway on the James River. The state is working with the owner of Harvell Dam to finalize a monitoring plan for the Harvell fishway that complies with their FERC license. The state also monitors the success of the Boshers Dam fishway by sampling the juvenile shad population to determine the ratio of wild vs. stocked fish.

Role of the State

State government participants include: DGIF, MRC, VCU and VIMS

Virginia's portion of the ten-year Bay-wide, restoration goal for fish passage of 1,357 miles is 415.5 miles. A coordinated approach is being taken to achieve that goal.

In addition to fish passage, the state also is leading the effort to reintroduce American shad to historic spawning and nursery grounds in tributaries of the Bay through a multi-state and federal agency hatchery stocking and monitoring program. Additional state activities related to the goal include stocking and data analysis.

Progress and Outlook

Virginia had reopened 37 miles prior to the setting of the ten-year goal via fish passage projects at Walker's, Manchester, Brown's Island, and Harrison Lake dams. Since 1993, an additional 153.6 miles have been reopened (William's Island, Boshers, Chandler's, and Harvell dams), for a total of 190.6 miles. Virginia has identified the final initiatives necessary to complete its portion of the ten-year goal. Passage projects at the Abutment and Brasfield dams on the Appomattox River (121.4 miles), Embrey Dam on the Rappahannock River (70.6 miles), and the Ashland Mill and the Ashland Water Supply (37 miles) dams on the South Anna River, would open 419.6 miles and satisfy the Virginia commitment. Design of a fish passage structure for the Abutment Dam is near completion, and construction is scheduled for 2001-2002. The fish lift at Brasfield Dam will go into operation when the Abutment Dam fishway is opened. Plans to remove Embrey Dam by 2004 are currently being formulated by the U.S. Army Corps of Engineers in cooperation with the state, the City of Fredericksburg, and Stafford County.

A total of 22 species of fish have been documented at the Boshers Dam fishway including the primary target species American shad. Absolute numbers of American shad have been relatively low but have nearly doubled annually since monitoring began in 1999. Initial reports of the Harvell Dam fishway indicate that most of the target species are using the fishway.

American shad stocking efforts currently are focused on reintroduction of this species above Boshers Dam in the upper James River. To date, 71.1 million tagged shad fry have been released, with the James receiving 54.7 million and the Pamunkey 17.0 million. Adult shad of hatchery origin have now reached maturity and have been returning to the James and Pamunkey rivers since 1997. In 2000 and 2001, adult shad of hatchery origin returning to the upper James River made up 77.9 and 81.9 percent, respectively, of the shad spawning run. Shad of hatchery origin made up 42.2 and 41.4 percent, respectively, of the spawning fish returning to the lower James in those years.

Wild juvenile shad have been documented upstream of Boshers Dam both in 2000 and 2001 by the Fish Passage and Shad Restoration programs.

Additional Efforts

No additional efforts are required to identify the final projects necessary to meet the ten-year goal.

The monitoring program for the Boshers Dam fishway will continue to be fine-tuned, and the data will be analyzed to learn more important information about the target species. A monitoring plan for Harvell Dam fishway will be developed. When Embrey Dam is removed, the state will expand its Rappahannock River alosid monitoring efforts to include upstream sites to monitor the success of the removal.

As more information is learned about juvenile shad in the James River, monitoring protocols will evolve as necessary. Future American shad stocking efforts will focus on the Rappahannock and other rivers.

1.3.2 *By 2002, set a new goal with implementation schedules for additional migratory and resident fish passages that address the removal of physical blockages. In addition, the goal will address the removal of chemical blockages caused by acid mine drainage. Projects should be selected for maximum habitat and stock benefit.*

Approach to Implementation of the Commitment

The same approach and techniques will be used as in “Commitment 1.3.1”

Role of the State

State government participants include: DGIF, MRC, VCU and VDOT

The state will continue to participate in the Bay Program and coordinate its fish passage efforts through the Fish Passage Task Group of the Non-Tidal Habitat Workgroup. Virginia will also continue the American shad stocking effort to supplement wild spawning.

Progress and Outlook

Several potential projects are being considered in the James, Rappahannock, and York basins. For example, initial contacts have been made concerning the potential removal of Woolen Mills Dam on the Rivanna River, which is the first blockage on that river. The Rappahannock Basin Impediment Survey conducted by the state identified several dams and a few road culverts that may require fish passage. A pilot project has begun that will identify a few specific road culvert sites that would be retrofitted for fish passage over the next several years.

Virginia has no known chemical blockages that currently impede migration of target species.

Additional Efforts

Further identification of sites is needed followed by setting implementation schedules.

1.3.3 *By 2002, assess trends in populations of priority migratory fish species. Determine tributary-specific target population sizes based upon projected fish passage, and current and projected habitat available, and provide recommendations to achieve those targets.*

Approach to Implementation of the Commitment

Previous efforts to characterize the biological health or stock status of striped bass, American shad and river herring (blueback herring and alewife) will continue in 2002 and beyond. Of the four species, all are managed by an interstate (Atlantic States Marine Fisheries Commission) and Chesapeake Bay management plan, but only striped bass is considered as a restored population; the others (allosines) are considered as moderately to severely depleted. Similarly, a clear trend in abundance or exploitation only exists for striped bass. Since landings or harvest data no longer provide an adequate measure of relative abundance for these species (striped bass is under quota, American shad harvest is under a moratorium and herring harvests are sporadic), other methods, such as mark-recapture, need to be continued and improved. Efforts to modernize estimates of current and projected population sizes and habitat availability will begin by 2002, as past estimates of system- and stock-specific carrying capacities and spawning acreage, for these important species, is dated (1987). Status of the Virginia "stock" of striped bass will continue to be assessed each year, using estimates of survival from Bay-wide mark-recapture programs. Virginia will need to continue its programs for monitoring relative abundance of striped bass juveniles, American shad juveniles and adults and river herring juveniles, at a minimum. Owing to the moratorium on American shad, special programs will be needed to develop estimates of adult abundance and potential fishing mortality rate targets, on a tributary-specific basis.

Role of the State

State government participants include: DGIF, MRC and VIMS

State programs are adequate and necessary (Atlantic States Marine Fisheries Commission plan compliance requirements) for monitoring the status of the striped bass stock. Recent federally-funded state programs to assess relative abundance and relative exploitation riverine stocks of American shad will need to continue and be augmented by projects to estimate actual adult stock abundance, in order to establish first-order target fishing mortality rates. The state and federal agencies will work towards the development of modern estimates of tributary-specific target stock sizes for American shad and river herrings, but this process will be hampered by a lack of knowledge about current stock sizes. For example, the state has been monitoring the relative abundance of migratory fishes at the fall line of Virginia's tributaries for several years. While this data gauges inter-annual abundance trends it cannot be used to estimate actual stock sizes.

Progress and Outlook

Absent current knowledge about the stock status of American shad and the river herrings, a considerable effort will be needed to develop even approximate tributary-specific target stock sizes for American shad and river herrings, based on projected fish passage. The Boshers Dam fishway is monitored by the state to estimate the number of American shad

moving into the upper James River annually. This type of information may prove to be a useful tool in tracking the progress of restoration efforts. Current knowledge of the status of the Bay-wide stock of striped bass and projected fish passage acreage still will not afford a clear-cut opportunity to devise tributary-specific targets for this species; as striped bass is less dedicated to specific tributaries, in comparison to the alosine species.

Additional Efforts

Of these four species, knowledge of the health or stock status of the alosines needs significant improvements. It will take several years and additional, dedicated programs to achieve a sound perspective on the biological status of these species.

1.3.4 *By 2003, revise fish management plans to include strategies to achieve target population sizes of tributary-specific migratory fish.*

Approach to Implementation of the Commitment

Virginia actively participates in the development and modification of interstate and Chesapeake Bay Fishery Management Plans for these species, but the Chesapeake Bay plans would serve to house any strategies devised for achieving target population (stock) sizes. Since the Virginia in-river and Chesapeake Bay fisheries for American shad stocks are under moratorium, any initial attempts to devise more than highly approximate target levels of abundance depend on current and needed programs designed to obtain even relative indicators of American shad tributary-specific abundance. Currently, there exists a mixed-stock fishery for American shad along Virginia's coast for which a 40% reduction in effort is mandated by the relevant IFMP by 31 December 2002, and that does represent a strategy of the interstate plan to improve the health of in-river stocks. River herring (blueback herring and alewife) stocks are considered depleted, but a quantified assessment of stock sizes does not currently exist. Striped bass stocks are considered as recovered and are fished according to harvest targets set annually by the interstate plan. Stock sizes for Virginia are at an all-time high, based on several surveys.

Role of the State

State government participants include: DGIF, MRC, ODU, VCU and VIMS

The state has a coordinated approach to monitoring programs that are mandated by the relevant interstate fishery management plans or recommended by the Chesapeake Bay fishery management plans. State agencies and universities conduct the monitoring programs. Results of these monitoring efforts are used in annual determinations of harvest levels for recreational and commercial fisheries for striped bass, to assess the status of American shad stocks, and provide necessary revisions of the Chesapeake Bay fishery management plans. The Chesapeake Bay fishery management plans would be appropriate for including any necessary strategies designed to achieve target stock levels for these important species.

Other data from state long-term monitoring of the relative abundance of migratory fishes at the fall line may be useful for inter-annual trend analysis.

Progress and Outlook

The 2003 commitment is especially relevant to American shad since these stocks are under restoration, a Chesapeake Bay-wide moratorium, and are subject to an unknown level of exploitation by a coastal fishery. Revising management plans to implement the scheduled reduction in coastal fishing effort may or may not serve to significantly improve current American shad population sizes. Ultimately, a total ban on fishing for American shad in Virginia coastal waters, combined with in-river state restoration efforts will constitute the revised fishery management plan to achieve the targets for American shad. As a result of the current harvest moratorium, we cannot apply traditional stock assessment methods that employ fishery-dependent data to the problem of setting restoration targets. In addition, we cannot set targets that require fishery-dependent data to measure achievement. In the near future fishery-independent programs must be developed to ascertain reliable estimates of American shad abundance and river herring abundance and exploitation levels.

Additional Efforts

A target-setting workshop for American shad will be completed by late 2001. Participants will include scientists and managers from Virginia State agencies and universities and stock assessment experts from outside the Commonwealth. The workshop will examine independent technical methods to set meaningful restoration targets and produce a published document that details these approaches and recommends methods to set meaningful targets. The workshop is designed to be responsive to the needs of the Chesapeake Bay Program as well as the mandates of the ASMFC, but represent only the first step towards developing appropriate strategies to achieve target stock sizes, where necessary, on a species-specific basis.

1.4 Multi-species Management

1.4.1 By 2004, assess the effects of different population levels of filter feeders such as menhaden, oysters and clams on Bay water quality and habitat.

Approach to Implementation of the Commitment

In terms of monitoring finfish (includes filter feeders) *CHESFIMS* (funded by NOAA) provides a bay-wide approach to monitoring key finfish filter feeders. This trawl program, initiated in 2001, coupled with results from historic trawl programs will provide baseline data on juvenile abundance of fishes. Shellfish abundance has been mapped by previous standing stock surveys and there are also current efforts to map hard clam standing stocks. There are historical and recent records of physico-chemical attributes of the Bay. Less available, are habitat-related data. Nonetheless, this suite of biological, physical and chemical data can be used to define the inter-relationships of filter feeders, water quality and habitat.

Role of the State

State government participants include: MRC and VIMS

Virginia continues to monitor the stock status of key filter feeders. In turn, changes in abundance (for example) of key filter feeders can be associated, to an extent, with changes in water quality and habitat.

Progress and Outlook

Data collection is ongoing, and historical data exist from several sources, to assist in assessing these inter-relationships and afford a broad-based characterization of the variability among these three components of ecosystem dynamics.

Additional Efforts

Efforts will be needed to collect and condense historical data sets. Comprehensive shellfish standing stock estimates (such as those previously accomplished) will be necessary to delineate cause and effect relationships among physical, chemical and biological components.

1.4.2 *By 2005, develop ecosystem-based multi-species management plans for targeted species.*

Approach to Implementation of the Commitment

The state plans to inventory results from other studies, relative to multi-species trophic-dynamic models results, in addition to development of its own set of predator-prey models. The state also will modernize life history aspects of important Chesapeake Bay fishes. These types of information, coupled with available information on abundance of juvenile fish, derived from current or past trawl surveys, will provide the basis for development of multi-species management plans.

Role of the State

State government participants include: MRC and VIMS

Virginia has initiated several approaches towards the development of ecosystem-based multi-species plans. The state has been funded by the Environmental Defense to assess existing information on trophic-level interactions, and preliminary work on the simulation of a multi-species (finfish) model, as part of a Chesapeake Bay Stock Assessment Committee (NOAA) funding, has been completed. Additionally, the Chesapeake Bay Living Resources Subcommittee's Fisheries Management Planning and Coordination Workgroup has initiated discussions on multi-species plan formulation.

Progress and Outlook

Dedicated, funded efforts exist for both model formulation and data collections necessary to initiate multi-species management plans.

Additional Efforts

Efforts will be needed to collect results from diverse models and synthesize those results into a format that supports a multi-species plan approach. Mandates associated with existing and new interstate or federal management plans will likely complicate the abilities of Bay managers to implement multi-species plans.

1.4.3 *By 2007, revise and implement existing fisheries management plans to incorporate ecological, social and economic considerations, multi-species fisheries management and ecosystem approaches.*

Approach to Implementation of the Commitment

Implementation depends on the soundness of the biological foundation of the plan. For example, it will be easier to incorporate these considerations into a multi-species plan for biologically stable species. The choice of target species will also determine the success in implementing such a plan.

Role of the State

State government participants include: MRC

The state standards for preparing single species fisheries management plans include consideration of social and economic factors. Incorporation of these factors and ecological considerations into a multi-species plan will entail extensive outreach to stakeholders, but efforts may be complicated by existing or new requirements associated with interstate or federal mandates.

Progress and Outlook

Dependent on the development of ecosystem-based multi-species management plans for targeted species.

Additional Efforts

These will be determined as progress on plan development occurs.

1.5 Crabs

1.5 *By 2001, establish harvest targets for the blue crab fishery and begin implementing complementary state fisheries management strategies Baywide. Manage the blue crab fishery to restore a healthy spawning biomass, size and age structure.*

Approach to Implementation of the Commitment

For the first year, Virginia and other Bay jurisdictions have or will implement complementary harvest reduction measures (e.g. less crabbing days or less crabbing time per day) to provide for a potential reduction in exploitation rates of 5% or greater.

Virginia adopted harvest reduction measures for its crab pot and peeler pot fisheries, dredge fishery and licensed recreational fishermen. The Bay jurisdictions have committed to reduce the fishing mortality rate to 0.7 (from 0.9) by 2003, through various harvest and effort reductions.

Role of the State

State government participants include: MRC and VIMS

Virginia, Maryland and the Potomac River Fisheries Commission adopted a fishing mortality rate target ($F=0.7$) in October of 2000.

Progress and Outlook

Achieving the target fishing mortality rate ($F=0.7$) may require more than a 15% reduction in the Bay-wide harvest of blue crab, if current low abundance levels decline further. It is evident that harvest reduction strategies, alone, may not afford the best approach for achieving the target fishery mortality rate. Management strategies that will augment spawning or abundance (such as closed areas or sanctuaries), in conjunction with harvest effort reductions will be required to effectively reduce the fishing mortality rate.

Additional Efforts

Managers and the harvesting and processing sectors associated with the blue crab fishery will need detailed economic information on the benefits and detriments associated with gear-specific or market category-specific modes of harvest. In conjunction with the economic issues, the biologists need to develop safe levels of take from the various peeler and hard crab fisheries.

SECTION 2.0 VITAL HABITAT PROTECTION AND RESTORATION

SECTION GOAL:

Preserve, protect and restore those habitats and natural areas that are vital to the survival and diversity of the living resources of the Bay and its rivers.

2.1 Submerged Aquatic Vegetation

- 2.1.1 *Recommit to the existing goal of protecting and restoring 114,000 acres of submerged aquatic vegetation (SAV).***
- 2.1.2 *By 2002, revise SAV restoration goals and strategies to reflect historic abundance, measured as acreage and density from the 1930s to the present. The revised goals will include specific levels of water clarity which are to be met in 2010. Strategies to achieve these goals will address water clarity, water quality and bottom disturbance.***
- 2.1.3 *By 2002, implement a strategy to accelerate protection and restoration of SAV beds in areas of critical importance to the Bay's living resources.***

Approach to Implementation of the Commitment

As planned, the Living Resource Subcommittee (LRSC) of the Chesapeake Bay Program will coordinate the identification of a new SAV goal among the Bay Program partners as well as the development of strategies to accelerate restoration efforts.

The Commonwealth recognizes that restoration of SAV to historical levels will not be accomplished without additional improvements to water quality conditions in many regions of the bay and its tributaries. Watershed inputs of nutrients and sediments act both directly and indirectly to reduce light available for SAV growth and survival by reducing water clarity and increasing biological fouling rates. Although, SAV transplantation efforts are important for recovery in many areas by increasing SAV species diversity and by providing the initial source material for re-growth, the long-term survival, growth and spreading of these transplants will not be possible without adequate water quality conditions. Therefore the Commonwealth is committed to facilitating SAV restoration by supporting both SAV research and transplanting activities as well as implementing strategies for water quality improvement. Specific objectives include:

1. Achieving water clarity targets in shallow water areas necessary for re-growth of SAV to historical levels, either by reducing nutrients, suspended solids or both. Specific targets may be tributary specific and require unique strategies for nutrient or sediment reduction in each river system.
2. Minimizing direct and indirect impacts that will preclude SAV growth in areas that currently or historically have supported SAV.

3. Supporting SAV restoration efforts in areas where SAV is absent or at very low abundance and where water quality can sustain new populations by meeting water clarity targets established for these areas.
4. Supporting research aimed at increasing knowledge of the relationships of SAV and environmental stresses that limit growth, SAV utilization by other living resources, sustainable use by multiple user groups and effective restoration and propagation.

Role of the State

State government participants include: DCR, DEQ, MRC and VIMS

Of the 114,000-acre goal approximately 51,700 acres are within Virginia's portion of the Bay. The 2000 SAV survey of the CBP documented 69,126 acres of SAV throughout the entire Bay and tributaries. This is up from 41,397 that existed in 1978 the first time a complete survey was conducted, but less than the peak abundance of 73,082 acres recorded in 1993. Although there have been fluctuations in recent years SAV coverage in Virginia's portion of the Bay for 2000 increased to 32,402 acres. These changes appear to be somewhat dependent on water quality from year to year possibly as a result of annual rainfall and pollutant runoff.

Agencies most involved in efforts necessary for SAV restoration and protection include the MRC (State-owned submerged lands management), VIMS (transplantation research and monitoring), DCR (Non-point source pollution management) and DEQ (Point source pollution management).

Progress and Outlook

So that we can maintain this trend, protection of SAV will need to continue through regulatory programs that manage use of submerged lands and fishery activities, and through the continuation of water quality improvement programs. This will include the implementation of nonpoint source pollution (NPS) reduction elements of Virginia's Tributary Strategies to reduce nutrients and sediment loads that affect SAV as well as nutrient reductions from point discharges.

Additional Efforts

SAV restoration efforts will also be dependent on improvements in water quality as well as the continuation of research devoted to SAV transplantation and the development of funding sources and voluntary programs. In addition, it will be important to continue the CBP's annual monitoring (conducted by VIMS) in order to track progress and changes in SAV distribution.

2.2 Watersheds

2.2.1 By 2010, work with local governments, community groups and watershed organizations to develop and implement locally supported watershed management plans in two-thirds of the Bay watershed covered by this

Agreement. These plans would address the protection, conservation and restoration of stream corridors, riparian forest buffers and wetlands for the purposes of improving habitat and water quality, with collateral benefits for optimizing stream flow and water supply.

Approach to Implementation of the Commitment

The Chesapeake 2000 Watershed Commitments (CWiC) task force was created by the Chesapeake Bay Program's Implementation Committee for the purpose of determining how to achieve the commitment "to develop and implement locally supported watershed management plans in two-thirds of the Bay Watershed" by the year 2010. Through the CWiC, each jurisdiction is developing protocol's addressing watershed management in their respective watersheds.

Role of the State

State government participants include: CBLAD, DCR, DEQ, DGIF, DOF and VIMS

Virginia's primary role under this commitment is to develop the watershed management planning protocol and assist local interests. Further, Virginia state agencies are responsible for the facilitation of programmatic integration relative to watershed based planning.

The state agencies are coordinating their water quality and habitat regulations, programs, and initiatives with federal, regional and bay-wide organizations wherever and whenever possible. Funding by the state is also being coordinated and linked to federal, regional and bay-wide organizations funding mechanisms when ever possible, in order to maximize desired results. Finally, the state is making a concerted effort to accommodate identified overlaps in water quality and habitat regulations, programs and initiatives along with the identification of information gaps whenever possible.

Progress and Outlook

The Virginia watershed planning workgroup has drafted the protocol for watershed management planning. This workgroup consists of the Virginia CWiC delegation and critical state agencies. The protocol is in the process of being reviewed by varies federal, state, and local government and agencies and should be implemented by 2002. With the finalization of the protocol and available resources this commitment should be reached by 2010.

Additional Efforts

In order to meet this commitment it is imperative that local governments and community watershed organizations stay engaged in the process. In addition, the state most foster cooperative and collaborative forums in each watershed to stay informed of the issues and provide feedback in each watershed.

2.2.2 *By 2001, each jurisdiction will develop guidelines to ensure the aquatic health of stream corridors. Guidelines should consider optimal surface and groundwater flows.*

Approach to Implementation of the Commitment

Virginia Natural Resource Agencies have set forth specific criteria through existing programs and initiatives. The tributary strategies steering committees, watershed forums (watershed conservation roundtables, commissions and councils) and local governments are implementing this commitment through these existing programs to include erosion and sediment control, stormwater and stream buffer ordinances and regulations.

Role of the State

State government participants include: CBLAD, DCR, DEQ, DGIF, DOF and VIMS

Virginia agencies will continue to support local efforts through technical assistance and expertise in addition to implementing existing aquatic health related programs. Further, funding is made available when possible.

Progress and Outlook

State agencies are working to increase compliance with riparian buffer and NPS regulations. These efforts include streamlining, coordinating and clarifying programs wherever possible.

Additional Efforts

Increased ability to achieve regulatory compliance will be needed to strengthen this commitment. In addition, increased funding will be needed for additional compliance personnel and local assistance grants.

2.2.3 *By 2002, each jurisdiction will work with local governments and communities that have watershed management plans to select pilot projects that promote stream corridor protection and restoration.*

Approach to Implementation of the Commitment

Local governments, watershed forums and community watershed organizations (CWOs) have integrated this commitment into existing and new volunteer monitoring efforts, local water quality studies and educational projects. The Water Quality Improvement Funds (WQIF) made available through the Water Quality Improvement Act (WQIA) and the Chesapeake Bay Small Watershed Grants Program has given localities limited resources to implement a number of protection and restoration projects.

Role of the State

State government participants include: CBLAD, DCR, DEQ, DGIF, DOF and VIMS

Virginia is aggressively seeking out sound projects that promote watershed planning and stream corridor protection and restoration. Continued educational and training programs are needed to increase local awareness of volunteer opportunities and increase available

funding. This is being accomplished through existing networks of watershed forums, localities and conservation watershed organizations.

Progress and Outlook

Localities, along with state agencies, continue to make strides in areas of stream corridor, wetlands and sensitive land area restoration and protection. Increased and better mitigation practices are being implemented, BMPs are being established in areas where none previously existed, and restoration projects are being implemented through cost share programs and WQIF. However, most of these are not being conducted under a Watershed Management Plan (WMP). Virginia is working with localities and other parties to identify pilot projects in areas covered by existing WMPs.

Additional Efforts

Extensive effort is needed to continue promoting the benefits of stream corridor protection and restoration to localities. Emphasis should be placed on concepts of increased quality of living and economic benefits associated with areas of greater environmental quality. Further, strong watershed planning tools are needed to assist local interest in this effort.

2.2.4 By 2003, include in the “State of the Bay Report,” and make available to the public, local governments and others, information concerning the aquatic health of stream corridors based on adopted regional guidelines.

Approach to Implementation of the Commitment

The implementation of this commitment is being fulfilled through water quality, SAV and benthic monitoring efforts by numerous local, state, and federal agencies along with citizen and environmental groups monitoring activities. In addition, universities, private consulting firm, state and federal agencies have conducted environmental studies of tributaries in the Chesapeake Bay Watershed. This information will be compiled for public dissemination.

Role of the State

All state government agencies and institutions with relevant information are participants in this process.

In the area of data gathering and analysis state agencies are working with localities and environmental organizations to develop consistent tracking criteria. Virginia will continue promoting environmental studies in all watersheds and work through the roundtables and other avenues to collect and assimilate the data. Additionally, Virginia agencies will work with our CBP partners to coordinate the distribution of the CBP *State of the Bay Report* to the public, local governments and others.

Progress and Outlook

Watershed forums working with state agencies, localities and CWOs can assist in targeting stream corridors that have degraded waters by using the base-line data that has

been collected. The roundtables can also assist in guiding the development of Implementation Plans required by the TMDL process.

Additional Efforts

Ensuring the long-term provision of information on the health of stream corridors will require additional resources over time. Involving local governments and other in the review and understanding of that information and the continuing evolution of that kind of information system and process will require effective communication, consultation and coordination at the watershed level.

2.2.5 By 2004, each jurisdiction, working with local governments, community groups and watershed organizations, will develop stream corridor restoration goals based on local watershed management planning.

Approach to Implementation of the Commitment

Watershed forums, in cooperation with agencies, will be a primary vehicle to develop basin wide goals based on existing planning and monitoring data. These goals will then be integrated into the stream corridor restoration components of locally driven watershed management planning. The Virginia watershed planning protocol will serve as a guide for local interest in the commitment. These goals will be coordinated with Tributary Strategy implementation, TMDLs, CREP program, WQIA and other initiatives, to the extent feasible.

Role of the State

State government participants include: CBLAD, DCR, DEQ, DGIF and DOF

Virginia agencies will assist in the development of stream corridor restoration goals by lending technical expertise on any task force working on this commitment. Further, it is the responsibility of the agencies to provide direction to watershed forums in the development of the basinwide goals.

Progress and Outlook

Though progress has been made in reaching this commitment, increased efforts are needed by localities to define criteria to be used as benchmarks when evaluating progress made by localities to meet stream corridor restoration goals.

Additional Efforts

The state will be considering ways to enhance mechanisms for communication, consultation and coordination on environmental and natural resource issues at the regional, river and watershed level. (See discussion in Part One on regional communication, consultation and coordination.) Additional resources will be needed to meet the demand for stream protection and restoration of riparian corridors. The federal/state Conservation Reserve Enhancement Program (CREP) will assist funding riparian buffer, wetland restoration and conservation easements on agricultural lands meeting eligibility requirements. Additional resources also will be needed for urban, suburban and other lands not qualifying for CREP.

2.3 Wetlands

2.3.1 Achieve a no-net loss of existing wetlands acreage and function in the signatories' regulatory programs.

Approach to Implementation of the Commitment

This commitment is being met in Virginia through the regulation of all non-tidal and tidal wetlands through permitting programs that require avoidance and minimization of impacts to the maximum extent practicable, and compensation for unavoidable impacts. Wetlands compensation shall be sufficient to achieve no net loss of wetland acreage and function, and can take the form of wetland creation or restoration, or preservation of wetlands and upland buffers only in conjunction with creation or restoration activities.

Role of the State

State government participants include: CBLAD, DEQ, MRC and VIMS

DEQ will implement a revised non-tidal wetland permitting program through its Virginia Water Protection Permit (VWPP) Program, beginning October 2001. The VWPP program along with the Commonwealth's existing tidal wetland program administered by MRC and Local Wetlands Boards with scientific and technical support from VIMS provide the regulatory mechanism through which a no-net loss of existing wetlands acreage and function can be maintained.

In addition, the Chesapeake Bay Preservation Act's Regulations apply to the 84 localities of Tidewater, Virginia and require these localities to identify and protect sensitive lands, including tidal wetlands and certain nontidal wetlands as Resource Protection Areas (RPAs). Only water dependent uses and redevelopment are allowed in RPAs. The Regulations give these local governments additional authority to protect wetlands through preservation beyond applicable state and federal permits.

Progress and Outlook

Starting in October 1, 2001 the state began to implement a series of general permits to cover impacts to wetlands that require specified compensation ratios for any impacts over 1/10 acre, and reporting of all impacts, designed to assess how well we are meeting the no-net loss commitment. For non-tidal wetlands the state will continue to issue individual permits for larger impacts, also requiring compensation to achieve no net loss.

As recommended by the Citizens Wetlands Advisory Committee Report the state is in the process of revising its current Mitigation/Compensation policy to meet the no-net loss goal for tidal wetlands. While permitted loss have been reduced to a few acres per year (average of 2-4) some of which are replace through compensation requirements most non-compensated losses are associated with shoreline stabilization projects resulting in small losses where individual compensation efforts are not always practical. Since state law allows for the use of mitigation banks as a means of compensating for unavoidable

tidal wetland losses, the state has developed guidelines for the development and placement of mitigation banks. Another alternative may exist in the form of fees paid in lieu of small wetland creations. Fees could be combined to fund larger, more efficient wetland creation projects. These efforts could be administered at the local, regional or state level.

Additional Efforts

Along with the development of compensation programs, tracking and monitoring of all permitted projects and compensation requirements will be necessary to ensure this commitment continues to be met.

2.3.2 By June 2010 achieve a net resource gain by restoring 25,000 acres of tidal and non-tidal wetlands. To do this we commit to achieve and maintain an average restoration rate of 2,500 acres per year basin wide by 2005 and beyond. We will evaluate our success in 2005.

Approach to Implementation of the Commitment:

Virginia's approach to implementing the wetland restoration commitment involves building on the existing statewide voluntary restoration program and the Virginia Conservation Reserve Enhancement Program (CREP). This approach relies largely on private citizens, corporations and groups voluntarily restoring wetlands on their lands with technical assistance and some financial resources being supplied from the state and federal government.

Role of the State:

State government participants include: DCR, DGIF

The Commonwealth of Virginia, through a voluntary program staffed and coordinated by DGIF has been engaged in the restoration of wetlands since 1989. On October 20, 2000, Governor James S. Gilmore committed to restoring 10,000 acres of wetland in Virginia by 2010. Of these 10,000 acres, 6,000 are to be restored in the Chesapeake Bay Drainage. To ensure the best success for this effort, Governor Gilmore issued Executive Order 72(00) establishing the Virginia Wetlands Restoration Coordinating Committee and requiring all state agencies holding public land to identify, restore where feasible, and develop management plans for wetlands under their control. This Coordinating Committee is comprised of the executive leadership of state land holding agencies, Universities and state regulatory agencies. The Coordinating Committee operates under the joint chairmanship of the Directors of DGIF and DCR.

The duties of the Coordinating Committee are: promote the voluntary establishment or restoration of wetlands (tidal and nontidal) by private landowners throughout the Commonwealth; coordinate a comprehensive survey of public lands held by the Commonwealth, as well as lands purchased with state funds but held by private organizations, in search of suitable sites for wetland creation, preservation, and enhancement, and provide the Secretary of Natural Resources with an estimate of the cost

and opportunities for funding the restoration or establishment of wetlands on public lands.

In order to meet the goals established by the Executive Order, the Coordinating Committee developed a five-part strategy. This strategy has the following tasks: 1) Restore wetlands on surplus state lands and place existing wetlands on these lands in conservation easements; 2) Restore wetlands on state owned lands currently held by the various agencies and institutions of higher education and place, where appropriate, conservation easements on existing wetlands; 3) Restore wetlands on private lands in Partnership with landowners; 4) Purchase easements on private lands suitable for wetland restoration or preservation; 5) Work with local governments to restore wetlands on their public lands.

Progress and Outlook:

Since the Commonwealth agreed to the Chesapeake 2000 commitments, cooperative partnerships between state and federal agencies and private groups have restored more than 800 acres of wetlands. State land management agencies have identified an additional 600 acres of wetlands for restoration and more than 1000 acres for preservation. Presently, the Commonwealth has more than 100,000 acres of state owned wetlands under preservation.

Virginia's Conservation Reserve Enhancement Program (CREP) has targeted 4,500 acres statewide for wetland restoration. The Chesapeake Bay drainage has been targeted for 3,000 of the 4,500 acres. CREP offers cost-share payments and annual rental payments to property owners electing to restore wetlands on their property. In addition, the Commonwealth offers a conservation easement option on all wetlands restored under CREP.

Additional Efforts

The majority of the restorable wetland acreage in the Bay basin is privately owned. This acreage provides productive agricultural benefits and is often targeted for development. Because of these qualities, wetlands restoration on these sites are expensive and difficult to implement. For wetland restoration on these lands to be successful, increased financial incentives, in addition to CREP, are required. Additionally, in order to provide technical assistance to property owners in implementing wetlands restoration additional resources will be needed.

2.3.3.1 Provide information and assistance to local governments and community groups for the development and implementation of wetlands preservation plans as a component of locally based integrated watershed management plan.

2.3.3.2 Establish a goal of implementing the wetlands plan component in 25 percent of the land area of each state's Bay watershed by 2010. The plans would preserve key wetlands while addressing surrounding land use so as to preserve wetland functions.

Approach to Implementation of the Commitment:

Land use planning and management in Virginia is primarily accomplished at the local level. For this reason, the Virginia strategy will emphasize the provision of technical assistance and planning support to local governments as the basic mechanism for achieving the goal. The strategy will involve: identification and dissemination of tools and guidance for local government planners; identification of key wetland resources in collaboration with local planners; tracking of preservation activities across the Commonwealth; and implementation of the preservation plans developed by local and state planners.

In that this process will involve the application of public resources, careful prioritization at both the local and state levels is necessary to ensure that the resources are properly allocated. The planning process developed under this strategy is intended to accomplish that prioritization

Role of the State:

State government participants include: CBLAD, DCR, DEQ, DGIF, DOF and VIMS

The Commonwealth of Virginia defines wetlands preservation as “the conservation of ecologically important wetlands in perpetuity through acquisition by purchase or donation, negotiated conservation easement, conservation tax incentive, or other mechanism, which precludes the conversion of a wetland to other uses.” It should also be recognized that wetland preservation requires addressing not just the area and size of a wetland but also the function. The surrounding land use and the subsequent management in and around the wetlands may significantly influence their function.

Virginia considers all wetlands to be important environmental resources. Virginia’s existing policy for wetlands management (both tidal and nontidal) is to achieve no-net loss of the resource through its regulatory programs, and to achieve a net resource gain through voluntary programs. Existing policy commits to preventing unpermitted impacts to wetlands, and to ensure that compensation for unavoidable wetland losses through permitted activities achieves the goal of no-net loss of wetland acreage and function. The implementation of the wetland preservation strategy is a separate yet complimentary initiative to the existing regulatory programs and voluntary initiatives. Specifically the strategy supports and integrates Virginia’s no-net loss and net-gain goals, acknowledging that wetland preservation also involves careful management of both the wetlands themselves as well as the surrounding landscape. In most instances, the actions necessary

for preservation will be outside the scope of the wetland regulatory programs. The type of actions necessary to adequately preserve wetlands will vary according to the characteristics of the wetland itself, desired function/values to be preserved, and the nature of threats to those aspects. Actions will, in many cases, be undertaken voluntarily by landowners (private and public) using a variety of incentive programs.

Progress and Outlook:

DGIF and DCR, in cooperation with the Virginia Wetlands Restoration Coordinating Committee, state/federal/local agencies and conservation groups, are leading the ongoing efforts to preserve wetlands within the Commonwealth. Presently, the Commonwealth has more than 100,000 acres of state owned wetlands under preservation. Financial incentive programs, such as tax credit and cost-share programs, are available to property owners to restore and preserve wetlands.

CBLAD provides assistance, upon request, to localities to help identify and map the extent of wetlands, especially those required to be included in the Resource Protection Area component of locally designated Chesapeake Bay Preservation Areas and, potentially, subsequent watershed management plans. Through its conservation lands and Natural Heritage Conservation sites efforts DCR is prioritizing and identifying priority wetland areas for preservation.

Additional Efforts:

The development of an enhanced public awareness program to emphasize the importance of wetlands and their role in environmental and water quality protection would support the preservation effort. In addition, the Virginia Conservation Reserve Enhancement Program (CREP) and the Virginia Wetland Restoration Program would also benefit from the promotional effort.

2.3.4 Evaluate the potential impact of climate change on the Chesapeake Bay watershed, particularly with respect to its wetlands, and consider potential management options.

Approach to Implementation of the Commitment

This commitment represents a regional aspect of a national and global issue. Basic research, modeling, projections, etc. relating to possible impacts of climate change are being addressed by the federal government, research institutions, and related groups.

Role of the State

State staff participates in the CBP subcommittees and workgroups that will address this issue at the Chesapeake Bay level.

Progress and Outlook

EPA is conducting a national assessment of the possible effects of global climate change. One regional component of that national effort is the Mid-Atlantic Region Study, which is in progress.

Additional Efforts

None at this time.

2.4 Forests

2.4.1 *By 2002, ensure that measures are in place to meet our riparian forest buffer restoration goal of 2010 miles by 2010. By 2003, establish a new goal to expand buffer mileage.*

Approach to Implementation of the Commitment

The core work efforts are completed in association with federal and state cost-sharing practices to private farm and forest owners. Of primary importance is the Conservation Reserve Enhancement Program (CREP) which provides cost-share to landowners to "improve water quality and treat environmentally sensitive areas by promoting the voluntary establishment of forested streamside buffers and filter strips and the restoration of wetlands". Other cost-share efforts such as state Bay funds contribute to the overall goal of this commitment.

State Role

State government participants include: CBLAD, DCR, DEQ, DGIF, DGS, DOC, DOF, VDACS and VDOT

The Commonwealth of Virginia has a direct and significant role in the continuing establishment of riparian forest and other buffers. A Virginia Riparian Implementation Plan was developed in 1998 and contains specific tasks associated with buffer restoration and meeting the goal of the Adoption statement. Governor Gilmore signed Executive Order 48 (99) specifying certain riparian efforts including a 20% increase in the amount of riparian buffers on state-owned or managed land. The state, the soil and water conservation districts, and the federal Natural Resources Conservation Service (NRCS) are the major partners in this riparian restoration effort.

State agency participation revolves around a voluntary approach and the installation of soil and water practices. The incentive for practice installation is the federal and state cost-share programs administered by state agencies with field staffs able to conduct technology transfer to private landowners.

In addition, the Chesapeake Bay Act requires the designation of a 100-foot buffer along all tidal and perennial streams and wetlands. Use and development is severely restricted within the designated Resource Protection Area (RPA) where vegetation must remain intact. Forestry Best Management Practices (BMPs), including riparian corridor protection, are mandatory within the RPA.

Progress and Outlook

Virginia's share of the goal of 2010 miles of forested buffers by 2010 is 610 miles.

Without data for spring 2000 available yet, our current total for forested buffer miles is 259.8 miles or 43% of 610 miles. If one speculates on the spring 2000 data, Virginia should be over halfway there with eight years remaining. Conversely, we have accomplished half of our goal in just a few years.

The Baywide goal of 2010 miles will be reached easily probably by the end of 2003. CREP has a little over two years remaining prior to this program ending. Consequently, the timing for an expanded goal in 2003 is timely and appropriate. There are two concerns that hamper continued success. The first concern is the concept of "picking the low hanging fruit". The easier ones have been accomplished, the interested landowners have been contacted and what are left are more difficult landowners, perhaps with out of state residences, or less interested ones. A second concern is the high level of technical staff resources necessary to deliver this or any other conservation program. This type of cost-share program requires several field visits and one-on-one discussion with landowners. State budget restrictions and high turnover rates have affected program delivery, particularly in some geographical areas, despite the overall success. Additional resources would allow significantly more buffers to be installed.

Additional Efforts

- An expanded goal will allow greater influence in the growing urban arena.
 - Overall, increasing education on riparian forest protection and enhancement is essential to meeting the goal.
 - A targeted urban riparian restoration program with an educational component will yield significant gains for urban stream health.
 - Continuing federal support for cost-share programs is essential.
-

2.4.2 Conserve existing forests along all streams and shorelines.

Approach to Implementation of the Commitment

The current scope is voluntary. Riparian easements are available in CREP and in conjunction with the Virginia Land Conservation Foundation (VLCF) and Virginia Outdoors Foundation (VOF) easement programs. Other state-related riparian protection mechanisms include easements associated with Section 319 grant funding. For example, the Valley Conservation Council has been awarded Section 319 funding to restore riparian corridors and acquire easements in the Shenandoah Valley. Land trusts and conservancies acquire riparian easements in their normal process.

A Riparian Tax Credit passed the General Assembly in 2000 allowing for a tax credit of up to \$17,500 for maintaining a minimum 35 foot buffer during timber harvesting for a period of 15 years.

State Role

State government participants include: CBLAD, DCR, DEQ, DGIF, DGS, DOC, DOF, VDACS and VDOT

The Commonwealth of Virginia has a direct and significant role in the continuing establishment of riparian forest and other buffers. A Virginia Riparian Implementation Plan was developed in 1998 and contains specific tasks associated with buffer restoration and meeting the goal of the Adoption statement.

Many state agencies participate in a statewide Riparian Working Group chaired by the State Forester. This group will coordinate riparian activities statewide and ensure agencies promote and implement riparian restoration and conservation.

In addition, the Chesapeake Bay Local Assistance Department administers the Chesapeake Bay Act requiring the designation of a 100 foot buffer along all tidal and perennial streams and wetlands. Use and development is severely restricted within the designated Resource Protection Area (RPA) where vegetation must remain intact. Forestry Best Management Practices (BMP's), including riparian corridor protection, are mandatory within the RPA.

Progress and Outlook

With no numerical goal to track, progress is difficult to measure. DCR has established a Geographic Information System (GIS) for easement tracking. Riparian easements are reported also and the potential is there to report all forest conservation easements.

With this *Chesapeake Bay 2000* commitment, a combination of tax incentives and outright funding mechanisms serve landowners well who want to hold easements (i.e. conserve land). Tax incentives, particularly estate tax relief, are the primary drivers of increased easement acquisition. CREP contains a riparian easement option currently underutilized.

Additional Efforts

- Consider legislation to conserve existing riparian forests.
- Increase educational/information activities for assisting landowners.
- Continue federal support for conservation programs.

2.4.3 Promote the expansion and connection of contiguous forests through conservation easements, greenways, purchase and other land conservation mechanisms.

Approach to Implementation of the Commitment

The approach to this commitment in Virginia is voluntary. There is heightened interest from conservancies/trusts and state agencies in connecting forests. The growing use of GIS has allowed for more holistic planning across the Commonwealth. Easement programs and other land acquisition grant programs use connectivity as a major criteria for grant award.

State Role

State government participants include: DCR, DEQ, DGIF, DOF, VOF and VLCF

The Commonwealth of Virginia has a significant and continuing role in the expansion and connectivity of forests for ecosystem stability including water quality, wildlife habitat, recreation, and aesthetic values.

The Virginia Land Conservation Foundation is a state entity that accepts easement proposals and reviews twice a year for possible funding. Agency staff reviews proposals and organizes Foundation meetings.

DOF administers the Forest Legacy Program. This is a U.S. Forest Service Program whereby they give a block grant to state to purchase forest conservation easements or fee simple purchase. As with the Land Conservation Foundation, this program pays the landowner for the "development rights" based on a federal appraisal.

The Virginia Outdoors Foundation has been in existence since 1966. Their primary function is to acquire open space easements of benefit to the citizens of the Commonwealth and must be consistent with local land use planning.

Progress and Outlook

The number of donated easements is increasing as the word gets out on their positive tax and environmental benefits. The Virginia Outdoors Foundation has had a record year. The Virginia Land Conservation Foundation is not funded for the second half of this biennium. Private land trusts and conservancies seemed better equipped and organized to continue the upsurge in easement acquisition. DCR has entered into an MOU with VaULT, the consortium of Virginia land preservation organizations, to further advance easements and land conservation.

This commitment is similar to 4.1.3 related to conserving 20% of the watershed by 2010. A recent report by the Chesapeake Bay Commission and Trust for Public Land show that 1.1 million more acres must be preserved in the bay watershed. Many federal public funding opportunities such as CARA or Forest Legacy are risky and not consistent.

Additional Efforts

- Increase resources for land conservation activities.
- Expand GIS inventory to capture more easement holdings and begin targeting key land parcels.

SECTION 3.0 WATER QUALITY

SECTION GOAL:

Achieve and maintain the water quality necessary to support the aquatic living resources of the Bay and its tributaries and to protect human health.

3.1 Nutrients and Sediments

3.1.1 Continue efforts to achieve and maintain the 40 percent nutrient reduction goal agreed to in 1987, as well as the goals being adopted for the tributaries south of the Potomac River.

Approach to Implementation of the Commitment

In 1992, Virginia and the other Chesapeake Bay Program partners determined that the most effective means of reaching the 40 percent goal would be to develop tributary-specific nutrient reduction strategies in each river basin. Two major statutes that govern, guide, and provide a financing mechanism for the Commonwealth's partnership role in the tributary strategy initiative now appear in the Virginia Code. They are the *Tributary Strategy Law* (Article 2 of Chapter 5.1) enacted in 1996, and the *Water Quality Improvement Act* (WQIA) (Articles 1-4 of Chapter 21.1) passed by the 1997 General Assembly. The Shenandoah/Potomac Tributary Strategy was completed in December 1996, and the Secretary of Natural Resources approved strategies for Virginia's lower Bay tributaries (James, York, Rappahannock, and Eastern Shore) in August 2000. The tributary strategy process uses a cooperative, partnership approach with extensive public participation by the various stakeholders in the basins, including local governments, farmers, wastewater treatment plant owners, citizen conservation groups, business, industry, and scientific researchers.

Role of the State

State government participants include: CBLAD, DCR, DEQ, VDH and VDOT.

The state government coordinates the development and implementation of the various tributary strategies and works closely with local governments and other affected and interested parties in each watershed.

Progress and Outlook

As projected in the 2000 Status Report, the control actions identified in the Tributary Strategy to achieve non-point source nutrient load reductions were fully implemented in the Shenandoah-Potomac basin by the end of December 2000. Progress continues on the point source retrofits to install nutrient control systems, and three projects were finished in 2000 (HRRSA-North River STP, FWSA-Opequon STP, and SIL Clean Water), with the balance of projects in Northern Virginia scheduled for completion in Spring 2002.

A draft interim nutrient cap strategy for the Shenandoah and Potomac River basins was completed in 2001. Population growth and land use changes in the Shenandoah and Potomac River Basins will create challenges for maintaining the target nutrient load. It is estimated that continued strategy implementation will achieve the 40% goal in the next year or two, but that other increases in nutrient loads from population growth will undercut goal achievement in a short period of time if additional efforts are not undertaken.

Stakeholders across all river basins continue to support the incentive-based approach of the tributary strategies, and believe that funding of the Water Quality Improvement Fund (WQIF) is critical for attaining water quality goals. Revised tributary strategies are scheduled to be complete by September 2003 in response to new nutrient and sediment load allocations for the major Bay basins. Details on the need for strategy revisions are presented in Section 3.1.2, which follows.

Additional Efforts

Continued funding for the WQIF point source program is needed to involve all significant, publicly owned facilities in the Shenandoah/Potomac river basins (several still remain without grant agreements), as well as for targeted facilities in lower Bay tributary basins. Expenditures for nonpoint source programs will also need to be expanded to hold the line on the 40% goal and to begin full implementation of the lower Bay tributary strategies. Maintaining reduced loads may be greatly aided through the use of "trading" or other market based incentives.

3.1.2 By 2010, correct the nutrient- and sediment-related problems in the Chesapeake Bay and its tidal tributaries sufficiently to remove the Bay and the tidal portions of its tributaries from the list of impaired waters under the Clean Water Act.

Approach to Implementation of the Commitment

The *Chesapeake 2000* agreement has significantly shifted our goals and process for achieving water quality restoration in Chesapeake Bay and its tributaries. Instead of concentrating almost exclusively on nutrient load reductions, the Bay Program participants are now focusing attention on the water quality conditions needed to sustain living resources and protect important habitat areas. Once these environmental "criteria" are decided, then appropriate water quality standards will be adopted by the jurisdictions, and the annual nutrient and sediment loads that achieve these levels will be allocated among the major Bay tributaries. A set of important tools that will assist in determining the load allocations for the major Bay tributaries are the linked Watershed and Water Quality Models developed by the Chesapeake Bay Program. Nutrient and sediment reduction scenarios can be simulated using these models, and the resulting water quality responses can be compared to the selected living resource and habitat criteria. The Commonwealth is an active participant in the Chesapeake Bay Criteria Development process, and will stay involved in this activity through adoption of new or revised water quality standards. These activities are covered in Sections 3.1.2.1-5, which follow.

The process for achieving this commitment is underway among Chesapeake Bay Program participants. Virginia will strive for meaningful public involvement in the decision-making for this commitment. The Commonwealth will maintain its voluntary, cooperative programs that are currently being utilized for both point and nonpoint source nutrient and sediment control. Pollutant loading reductions will be achieved through continued application of programs such as the implementation of Best Management Practices, the Conservation Reserve Enhancement Program, and WQIF point source retrofit projects.

Role of the State

State government participants include: CBLAD, DCR, DEQ, DOH, VDOT

The Commonwealth has significant interests and support responsibilities for this commitment.

Progress and Outlook

The revised goals to be established for this commitment may be very challenging, but will not be known until criteria development and the standards adoption process have both been completed. It is likely that nutrient and sediment reductions required to attain any new or revised water quality standards will require revisions to the existing tributary strategies. In the interim, the state maintains an active role in the Chesapeake Bay Program dedicated to criteria development and new standards adoption. Virginia should maintain the current level of initiatives supporting tributary strategy implementation so that costs to achieve these goals are not borne solely within a 2-4 year period.

Additional Efforts

The total resources needed to meet this commitment have yet to be quantified, but costs could be significant if based on cost-projections associated with model reduction scenarios. A supplement to the *Chesapeake 2000* agreement, in the form of a Memorandum of Understanding, will involve the non-signatory states of NY, WV, and DE to aid in achieving this commitment. The Tributary Strategy process must be successfully integrated with the federally mandated TMDL Program. Development of nutrient criteria for the freshwater, free-flowing sections of the tributaries (above the fall line) must be tracked to assess their impact on those areas and the Bay's tidal waters. Increased funding for enhanced Chesapeake Bay monitoring programs may be necessary to evaluate criteria developed under 3.1.2.1, as well to measure ultimate success under this commitment, which is compliance with water quality standards in the future.

3.1.2.1 *By 2001, define the water quality conditions necessary to protect aquatic living resources and then assign load reductions for nitrogen and phosphorus to each major tributary.*

Approach to Implementation of the Commitment

The Chesapeake Bay Program's Implementation Committee established the Water Quality Technical Workgroup (WQTW) to oversee this commitment. The WQTW's task

has been to coordinate the technical and scientific activities for the process of integrating the cooperative and statutory programs of the Chesapeake Bay restoration effort. This includes development of quantitative water quality criteria and refined designated uses. The combination of these two elements forms the basis for revised water quality standards, and will define the appropriate water quality conditions, and the locations where they apply, for important living resources and habitat throughout the Bay and its tributaries.

Role of the State

State government participants include: DCR, DEQ, ODU and VIMS

This commitment has high priority for which the Commonwealth has significant interests and support activities.

Progress and Outlook

The first phase of this commitment was accomplished by the parameter-specific task groups (dissolved oxygen, water clarity, chlorophyll) under the direction of the WQTW. They defined the water quality conditions necessary to protect aquatic living resources, then made suggestions for refined designated uses and drafted quantitative criteria. The draft criteria, designated uses, and scientific basis for this effort have been presented to Virginia stakeholders in a series of public information briefings held during July and August 2000. The process to finalize the criteria will include opportunities for input and involvement by stakeholders through the fall of this year, and again during spring/summer 2002 after EPA publishes them for public review in the Federal Register.

It has already been recognized that the second phase of this commitment, assigning load reductions by each major tributary, has been delayed due to technical difficulties. Final calibration of the computerized Water Quality Model for the upper Bay was not completed as scheduled, and as a result the allocation of nitrogen and phosphorus load reductions to each major tributary has been rescheduled for September 2002 (rather than December 2001).

Additional Efforts

Agency staff will continue to provide public education and outreach, to aid in understanding the water quality criteria and designated uses that will drive the goal-setting process for nutrient reduction.

3.1.2.2 Using a process parallel to that established for nutrients, determine the sediment load reductions necessary to achieve the water quality conditions that protect aquatic living resources, and assign load reductions for sediments to each major tributary by 2001.

Approach to Implementation of the Commitment

This commitment is being addressed through the “goal-setting” and “load allocation” components of the process discussed above in 3.1.2.1. For all areas of the Chesapeake

Bay, improved modeling information will be used to determine the level of sediment reductions that would be beneficial and scientifically defensible for each tributary basin. These goals and load allocations will be based on estimations for achieving sufficient levels of water clarity in each tributary and in the main stem of the Bay, primarily to aid the growth and survival of underwater grasses. Because the existing Shenandoah and Potomac Rivers tributary strategy focused only on nutrient reductions, a sediment reduction goal will be developed for these basins. However, it is not known if the load allocation process will change existing sediment goals established through the tributary strategy process conducted in Virginia's lower tributary basins.

Role of the State

State government participants include: DCR, DEQ, ODU, VIMS

The Commonwealth has significant interests and support responsibilities for this commitment.

Progress and Outlook

As with nutrient load allocations, the scheduled completion of this commitment has also been delayed because of technical problems with computer modeling. As a result, the allocation of sediment load reductions to each major tributary has been rescheduled for September 2002 (rather than December 2001). Also, if it is determined that "in-place" historical sediment loads or natural resuspension of sediments in the tidal shallow waters are the primary factors affecting water clarity, then a new approach may need to be developed to attain the desired water clarity conditions.

Additional Efforts

Agency staff will continue to provide public education and outreach, to aid in understanding the water quality criteria and designated uses that will drive the goal-setting process for sediment reduction.

3.1.2.3 By 2002, complete a public process to develop and begin implementation of revised Tributary Strategies to achieve and maintain the assigned loading goals.

Approach to Implementation of the Commitment

Virginia will undertake the same type of public process and collective decision making used for development of the original tributary strategies, including public forums, informational meetings and coordination with existing organizations such as watershed conservation roundtables, councils and commissions. Revised nutrient and sediment load allocations for each tributary basin will be determined through the process discussed above in 3.1.2.1 and 3.1.2.2. However, implementation actions, program enhancements, and related activities to meet these revised goals will be identified in partnership with watershed stakeholders, and technical assistance will be provided by state agencies, conservation districts and regional planning agencies.

Role of the State

State government participants include: CBLAD, DCR, DEQ, DOF, DOH, VDOT, and VIMS.

This part of the impaired waters delisting effort is state responsibility with, of course, the involvement of many affected and interested parties.

Progress and Outlook

Because of technical delays with the Chesapeake Bay Water Quality Model, the Principals' Staff Committee of the Chesapeake Bay Program extended the completion date of this commitment to September 2003, rather than December 2002. In the meantime, agency staff completed a series of public briefings during the summer of 2001. Each of four meetings outlined the process for establishing new water quality standards designed to protect and restore critical habitat for the Bay's living resources. The meetings contained information related to developing nutrient and sediment reduction goals to meet these standards, and set the stage for the process to revise tributary strategies to reach those goals.

With the completion of strategies for all of Virginia's Chesapeake Bay tributary basins, watershed conservation roundtables are being organized by the Natural Resource Agencies in each of Virginia's major Bay basins. This is a cooperative effort involving Virginia State agencies, local governments, soil and water conservation districts, planning district commissions, industries, citizens, and existing watershed organizations. These roundtables will provide a watershed-based forum for stakeholders to participate in this overall process. Also, consideration is being given to reform the tributary teams, composed of staff from the agencies of the Natural Resources Secretariat, to advise watershed groups and other stakeholders on the technical aspects of the tributary strategy process.

Additional Efforts

The schedule for completing the revised tributary strategies (only a year after the allocation of nutrient and sediment loading goals among the major Bay basins), is a very ambitious timeline. The original strategies, for some river basins, were nearly three years in the making. The State agencies involved must dedicate sufficient staff time and other resources to this task, in order to meet the deadline.

3.1.2.4 By 2003, the jurisdictions with tidal waters will use their best efforts to adopt new or revised water quality standards consistent with the defined water quality conditions. Once adopted by the jurisdictions, the Environmental Protection Agency will work expeditiously to review the new or revised standards, which will then be used as the basis for removing the Bay and its tidal rivers from the list of impaired waters.

Approach to Implementation of the Commitment

The Commonwealth maintains an active role in the Chesapeake Bay Criteria Development process, and agency staff have been active participants on the Water

Quality Technical Workgroup and its various task groups. Once the Bay Program partners reach consensus on a “final” version of the draft criteria, EPA intends to publish them in the Federal Register by summer of 2002. This EPA action will trigger a national public review and comment period that lasts a minimum of 60 days. Following this review, EPA may make revisions to the criteria based on the comments received, and will then present them to the States for consideration as water quality standards. Virginia will follow the procedures in the Administrative Processes Act required for the standards adoption process, including public hearings, receipt and review of comments, and approval by the State Water Control Board. New or revised standards become final after EPA approval.

Role of the State

This commitment has high priority for the Commonwealth with significant support provided by DEQ.

Progress and Outlook

DEQ staff have participated in EPA Chesapeake Bay Program efforts to develop Bay-specific water quality criteria and refined designated uses. A series of public briefings on the work accomplished thus far were held during summer 2001 to prepare stakeholders and the general public for the standards adoption process. In a related action, the State Water Control Board (SWCB) recently approved revisions to the Dissolved Oxygen Standard and the amendments have been submitted to EPA Region III for review and approval. This action should enable DEQ’s Water Quality Assessment staff to better address naturally occurring dissolved oxygen violations in the Clean Water Act 305(b) reports and 303(d) listings.

Additional Efforts

Significant staff time must be devoted to this effort, in order to expeditiously convene public hearings, receive and respond to comments, and perform other administrative requirements of the APA. It will be necessary for the state to write implementation guidance so that the concentrations of dissolved oxygen that are naturally occurring can be determined in stratified estuaries and lakes and in minimal flow velocity waters (swamps).

3.1.2.5 By 2003, work with the Susquehanna River Basin Commission and others to adopt and begin implementing strategies that prevent the loss of the sediment retention capabilities of the lower Susquehanna River dams.

Approach to Implementation of the Commitment

Provide technical support to the Chesapeake Bay Program’s Modeling Subcommittee and other groups as needed.

Role of the State

Pennsylvania has the primary responsibility for this commitment; however, Virginia will continue to provide technical support to the Chesapeake Bay Program's Modeling Subcommittee.

Progress and Outlook

Agencies will track the progress in the Susquehanna River reservoirs as part of its participation in the CBP subcommittees and workgroups. Information produced in Pennsylvania may be directly relevant to some Virginia reservoirs currently faced with loss of storage capacity due to sediment retention (e.g., South Fork Rivanna Reservoir).

Additional Efforts

None identified at this time.

3.2 Chemical Contaminants

3.2.1 *We commit to fulfilling the 1994 goal of a Chesapeake Bay free of toxics by reducing or eliminating the input of chemical contaminants from all controllable sources to levels that result in no toxic or bioaccumulative impact on the living resources that inhabit the Bay or human health.*

3.2.2 *By Fall 2000, reevaluate and revise, as necessary, the "Chesapeake Bay Basinwide Toxics Reduction and Prevention Strategy" focusing on:*

Approach to Implementation of the Commitment

The reevaluation and revision of the "Chesapeake Bay Basinwide Toxics Reduction and Prevention Strategy" has been completed and is now referred to as the "Toxics 2000 Strategy." The implementation objectives, goals and commitments of the revised strategy will help strive toward the attainment of the 1994 goal of a "Chesapeake Bay free of toxics."

Role of State

State government participants include: CBLAD, DCR, DEQ, DGIF, VDACS, VDH, and VIMS.

Provide appropriate representation and support to the CBP Toxics Subcommittee and the applicable workgroups for implementation of the "Toxics 2000 Strategy".

Progress and Outlook

The commitment for a reevaluated and revised Toxics Strategy has been completed. Full implementation of the "Toxics 2000 Strategy" is ongoing.

Additional Efforts

Continued state support.

3.2.2.1 (The revision of the toxics strategy focused on two primary objectives, this and the following commitment.)

- 1. *Complementing state and federal regulatory programs to go beyond traditional point source controls, including nonpoint sources such as groundwater discharge and atmospheric deposition, by using a watershed-based approach.***

Approach to Implementation of the Commitment

The Toxics 2000 Strategy considers nonpoint sources of chemical contaminants to be agricultural and urban/suburban stormwater runoff, atmospheric deposition, and groundwater. Efforts to reduce the input of toxic chemicals to the Bay and its tributaries from these sources are ongoing through the voluntary application of pollution prevention measures. Specific to groundwater, Bay scientists will synthesize available information on the groundwater contribution of chemical contaminants to the Bay and its rivers.

Role of State

State government participants include: CBLAD, DCR, DEQ, DGIF, VDACS, VDH, and VIMS.

Provide appropriate representation and support to the CBP Toxics Subcommittee and the applicable workgroups for implementation of the “Toxics 2000 Strategy”.

Progress and Outlook

For point source air emissions, which may contribute to chemical contaminant deposition, pollution prevention actions are ongoing with a reduction goal of 20% (by 2010) from 1998 levels. Regarding groundwater contributions of chemical contaminants, Bay scientists will complete the synthesis of available information by 2003.

Additional Efforts

The Toxics 2000 Strategy has many commitments to improve estimates of chemical contaminant inputs from nonpoint sources. Much work must be done to synthesize existing and new data from programs such as the Phase I and Phase II stormwater permits, TMDL development efforts, and demonstration projects, in order to reduce uncertainty and allow for meaningful progress tracking.

3.2.2.2 (The revision of the toxics strategy focused on this and the preceding commitment.)

- 2. *Understanding the effects and impacts of chemical contaminants to increase the effectiveness of management actions.***

Approach to Implementation of the Commitment

The Federally funded Chesapeake Ecotox Research Program (CERP) is a five-year program that provides academic researchers the opportunity to develop a management tool that will help establish the linkage between chemical contaminants and effects on the aquatic community. An Advisory Committee consisting of state and federal managers is

overseeing the development of this tool. The Toxics Subcommittee has also created a Science, Innovation, and Synthesis Workgroup to help focus on this commitment.

Role of State

State government participants include: CBLAD, DCR, DEQ, DGIF, VDACS, VDH, and VIMS.

Provide appropriate representation and support to the CBP Toxics Subcommittee, workgroups and Advisory Committees.

Progress and Outlook

The academic researchers are making progress in the development of the “management tool”. Quarterly meetings are held between the Research Team and the Advisory Committee to ensure the researchers are meeting the needs of the Resource Managers. Given the complexities of aquatic ecosystems and the number of chemical contaminants present in the environment, the outlook for achieving significant progress is long term.

Additional Efforts

Continued State advisory support.

3.2.3 *Through continual improvement of pollution prevention measures and other voluntary means, strive for zero release of chemical contaminants from point sources, including air sources. Particular emphasis shall be placed on achieving, by 2010, elimination of mixing zones for persistent or bioaccumulative toxics.*

Approach to Implementation of the Commitment

A voluntary mixing zone phase out strategy has been developed to target that portion of the commitment. As part of the strategy, a list of “persistent and bioaccumulative contaminants” (PBCs) has been generated. The list will be used to identify those facilities not meeting water quality standards at the point of discharge, and therefore rely on the use of an allowable mixing zone to achieve permit compliance. Voluntary pollution prevention measures may then be implemented for reductions or elimination of the listed chemical contaminants.

Role of the State

State government participants include: DCR, DEQ, DGIF, VDACS, VDH, and VIMS.

Provide appropriate representation and support to the Toxics Subcommittee and the applicable workgroups.

Progress and Outlook

By 2001, the development of a baseline for facilities not meeting water quality standards at the point of discharge will be complete. The initial emphasis on phasing out mixing zones will follow the geographic focus of the Toxics 2000 Strategy: 1) Areas of Concern (elevated contaminant levels and related aquatic impacts); 2) Areas of Emphasis

(elevated contaminant levels, or aquatic impacts, but no causal connection established); 3) 303(d) listed waters, impaired due to PBCs; and, 4) areas under finfish or shellfish advisories caused by PBCs.

Additional Efforts

Additional resources will be needed to meet this commitment. In particular, effective implementation will depend on greater efforts to work with individual facility owners to promote this voluntary, cooperative reduction effort.

3.2.4 *Reduce the potential risk of pesticides to the Bay by targeting education, outreach and implementation of Integrated Pest Management and specific Best Management Practices on those lands that have higher potential for contributing pesticide loads to the Bay.*

Approach to Implementation of the Commitment

Continue to build on the success of having reached the 75% Integrated Pest Management (IPM) implementation goal on agricultural lands by site specific targeting IPM and BMP implementation on environmentally sensitive lands on a watershed by watershed basis.

Role of the State

State government participants include: CBLAD, DCR, VDACS and VCE

DCR will coordinate with Cooperative Extension to target IPM outreach educational efforts on environmentally sensitive lands. Coordination will also occur with VDACS to incorporate BMP and IPM strategies into pesticide application training for farmers.

Progress and Outlook

IPM methodologies must be continually shared with farmers as pesticide products change, pest outbreaks occur and as the farming economy shifts. There is no beginning and end to the implementation of IPM. It is hoped that the momentum of the IPM efforts of the past will carry forth through 2010 as farmers make environmentally friendly pesticide management decisions based on good science and sound economics.

Additional Efforts

Because Federal Chesapeake Bay IPM funding has been eliminated, continued IPM efforts to protect site specific environmentally sensitive lands will have to be done through Cooperative Extension's ongoing programs with the cooperation of the DCR and VDACS. When available, special grant funds will have to be applied for to continue IPM efforts. For long- term continuity of the program, one full-time IPM Extension agent is needed to work in the Chesapeake Bay watershed. The current grant-funded IPM position is slated to terminate in December 2002.

3.3 Priority Urban Waters

3.3.1 *Support the restoration of the Anacostia River, Baltimore Harbor, and Elizabeth River and their watersheds as models for urban river restoration in the Bay basin.*

Approach to Implementation of the Commitment

Implementation is occurring through active participation by representatives from the three Regions of Concern (Elizabeth River in VA, Baltimore Harbor in MD, and Anacostia River in DC) in a series of Technical Exchange meetings. Also, progress specific to Virginia is being made through continued implementation of the Elizabeth Watershed Action Plan, which focuses on sediment remediation, stormwater runoff, wetland restoration, pollution prevention and monitoring.

Role of State

State government participants include: CBLAD, DCR and DEQ

Provide appropriate representation to the CBP Toxics Subcommittee to help implement and fulfill the commitments in the Toxics 2000 Strategy. In addition, continue working with the Elizabeth River Project (ERP), a locally based, conservation partnership, to implement and meet the goals of the Elizabeth River Watershed Action Plan. Support to ERP provided by DCR and DEQ.

Progress and Outlook

Progress is being made toward meeting this commitment through the Technical Exchange meetings. Additionally, with state assistance, the ERP has made significant strides in each of the above focus areas. Active and on-going partnerships have been created between Federal, State, and local governments, industry, and citizen groups.

Additional Efforts

Continuing support with state resources is necessary for ongoing sediment and wetland restoration projects that are part of the larger restoration program. Related monitoring activities to assess existing conditions and the effectiveness of management actions should also continue.

3.3.2 *By 2010, the District of Columbia, working with its watershed partners, will reduce pollution loads to the Anacostia River in order to eliminate public health concerns and achieve the living resource, water quality and habitat goals of this and past Agreements.*

Approach to Implementation of the Commitment

The Anacostia River, like many urban rivers, has a history of neglect and abuse. Efforts are being made to recover the river, its habitats and living resources. The river is of special interest to Mayor of the District of Columbia, and is a highly visible element in the landscape of the Nation's capitol. Consequently, it is receiving growing attention. A cooperative effort involving the District, the federal government, Maryland and two Maryland counties is moving forward on the restoration effort.

Role of the State

There is no direct role for the Commonwealth in meeting this commitment.

Progress and Outlook

The parties noted above will soon sign an ambitious Anacostia River Agreement. Progress is being made on a number of fronts.

Additional Efforts

No action required of the Commonwealth.

3.4 Air Pollution

- 3.4.1** *By 2003, assess the effects of airborne nitrogen compounds and chemical contaminants on the Bay ecosystem and help establish reduction goals for these contaminants.*

Approach to Implementation of the Commitment

Virginia requires companies to monitor nitrogen oxide (NOx) emissions from individual power plants and some major industries. This monitoring requirement will be expanded when new control requirements become effective in 2004. NOx emissions from motor vehicles, another large source of emissions, are calculated based on such factors as vehicle model years, vehicle speed, and miles traveled. Inventories of air pollutant emissions are updated periodically and tracked to determine the pollution trends over time. The state does not routinely assess the effects of airborne emissions on the Bay ecosystem. This type of assessment has generally been conducted by federal agencies, principally the EPA and programs funded by the Chesapeake Bay Program. Addressing the impacts of air pollutants from statewide sources to local waters would require an expansion of existing efforts.

Virginia continues to implement the federal Hazardous Air Pollutant program. To date, EPA has promulgated 41 standards for hazardous airborne pollutants, proposed 13, and plans to propose an additional 33 within the year. Virginia has one or more sources affected by 30 of the 41 standards, 6 facilities are subject to the proposed standards, and anticipates 26 sources will be covered by the standards still to be proposed. Overall, this program will reduce emissions of 188 Hazardous Air Pollutants. In addition to the ozone season NOx emission control strategy, the state administers various control programs on new utility and industrial facilities such as New Source Performance Standards (NSPS) and Best Available Control Technology (BACT). These are implemented through the new source permitting process that requires continuous control of NOx emissions throughout the year.

Role of the State

State government participants include: DEQ

The state monitors emissions from some sources and estimates emissions from others. The state also develops appropriate regulations and policies as necessary to control and reduce emissions of both NO_x and chemical compounds.

Progress and Outlook

Virginia currently is in the process of adopting regulations to substantially reduce NO_x emissions from power plants and large industrial sources. Each source is to demonstrate compliance with these new requirements by May 31, 2004. It is estimated that the total emission reductions from the affected sources will be on the order of 26,000 tons each year during the ozone season (May 1st through September). These reductions will occur from an ozone season baseline of 47,000 tons. The permanent statewide NO_x emission cap for all subject sources will be on the order of 21,000 tons per ozone season.

The state will continue to adopt the additional regulations for sources subject to the Hazardous Air Pollutant standards as EPA finalizes such standards. All covered sources are required to be in compliance with these standards and regulations by May 15, 2007. At this time, data are not available to quantify the amount of chemical reductions expected from this program between now and 2007.

Additional Efforts Required

In addition to efforts to control NO_x deposition, the Bay Program participants are beginning to investigate the magnitude of airborne ammonia emissions, especially from combined animal feeding operations, and their potential influence on water quality conditions.

3.5 Boat Discharge

3.5.1 By 2003, established appropriate areas within the Chesapeake Bay and its tributaries as “no discharge zones” for human waste from boats. By 2010, expanded by 50 percent the number and availability of waste pump-out facilities.

Approach to Implementation of the Commitment

The approach being taken is to use Federal Clean Vessel Act (CVA) funding to increase the number of pump-out facilities and work with the Clean Vessel Act Coordination Committee to include stakeholder support. While EPA, in coordination with DEQ, establishes “no discharge zones,” input from other agencies and institutions will be used to guide this process. Additional action is being implemented through Pollution Prevention Programs and the Virginia Clean Marina Program. While this remains a challenging directive, the Commonwealth continues to build stakeholder support to provide guidance.

- Use the Clean Vessel Act funding to increase the number of pump-out facilities and work through the Clean Vessel Act Coordination Committee to establish “no discharge zones”.

- Provide grant funding for marinas to participate in the pump out program to assist them with maintenance on pumpout equipment after it is installed. This may be accomplished through the reauthorization of the CVA.

Role of the State

State government participants include: DCR, DEQ, DGIF and VDH

State agencies provide grant funds and technical assistance to support the expansion of the pump-out facilities and regulate such facilities.

Progress and Outlook

Continue to provide pump-out facilities and work with the Clean Vessel Act Coordination Committee. Although Virginia will likely reach the goal to increase pump-out availability well before 2010, expanding the number and availability of facilities by 50% may be inadequate to prevent further pollution. The program does not account for pump-outs improperly operated or where local wastewater treatment systems are unable to handle additional wastes created by the expanded pump-outs.

Additional Efforts Required

Additional resources may be needed to more effectively manage the growth and operation of pump-out facilities. Improved coordination among agencies that monitor and regulate pump-outs and those which implement solid waste programs will also be addressed.

3.5.2 *By 2006, reassess our progress in reducing the impact of boat waste on the Bay and its tributaries. This assessment will include evaluating the benefits of further expanding no discharge zones, as well as increasing the number of pump out facilities.*

Approach to Implementation of the Commitment

Use the Clean Vessel Act (CVA) funding to increase the number of pump-out facilities and work through the Clean Vessel Act Coordination Committee to establish “no discharge zones.” Also, action is being implemented through Section 3.2.3 and the Virginia Clean Marina Program. Provide grant funding for marinas to participate in the pump out program to assist them with maintenance on pumpout equipment after it is installed. This may be accomplished through the reauthorization of the CVA.

Role of the State

State government participants include: DCR, DEQ, DGIF, and VDH.

State staff will work with marina operators and others to reassess progress.

Progress and Outlook

Continue to provide pump-out facilities and work with the Clean Vessel Act Coordination Committee. Work toward reauthorization of the Clean Vessel Act in 2003 or establish another group of stakeholders to provide guidance. By 2006, reassess

progress in establishing “no discharge zones.” While there is funding available to increase the number of pump-out facilities, many existing systems are not properly operated or maintained because of problems with solid waste handling and removal. Greater incentives or regulatory actions may be necessary to fully implement this action.

Additional Efforts Required

Additional resources may be needed to more effectively manage the growth and operation of pump-out facilities. There may need to be better coordination between agencies responsible for monitoring and regulating pump-outs with solid waste programs.

SECTION 4.0 SOUND LAND USE

SECTION GOAL:

Develop, promote and achieve sound land use practices which protect and restore watershed resources and water quality, maintain reduced pollutant loadings for the Bay and its tributaries, and restore and preserve aquatic living resources.

4.1 Land Conservation

4.1.1 *By 2001, complete an assessment of the Bay's resource lands including forests and farms, emphasizing their role in the protection of water quality and critical habitats, as well as cultural and economic viability.*

Approach to Implementation of the Commitment

The CBP has developed a Resource Lands Assessment Task Force (RLATF) and an associated Technical Workgroup to address this commitment. The groups have been charged with “developing an assessment that addresses the status, trends, and condition of resource lands (forest, agriculture, wetlands) and that analyzes information to identify issues, risks, and opportunities related to the roles identified in the Agreement commitment”. This assessment will integrate existing data sets, utilize information from special studies as case studies, and engage analysis to determine areas that are vulnerable, at risk, and important because of environmental or economic value. The commitment was originally slated for completion in December of 2001 although it has been subsequently determined that completion of a final product by this target date was unrealistic.

The Technical workgroup developed a two fold operating strategy that included:

- 1) Using the existing products/approaches, simultaneously to conduct an assessment of the three main themes of the Resource Lands Assessment (RLA) - environment, economics, and cultural.
- 2) Then tying the themes together using the environmental analysis as the “base” to which the other two themes would be added, and possibly developing a weighting scheme to incorporate watershed or county-based information. For the long term, the Bay Program would update and enhance the assessment as identified gaps in data were filled both at the Bay-wide and state level.

The Technical Workgroup determined that the current schedule should include creating an interim product to share with the RLATF around December 1, 2001. That Pilot Product will include examples of analyses and results for selected areas of the Bay Watershed that could represent an approach to apply to the entire Watershed. The Technical Workgroup will choose a few pilot areas, and, using the Delmarva

Conservation Corridor approach, create custom maps designed to allow people to see how well these products capture the habitat issues/questions being asked. The Workgroup will also develop a summary of what information is missing and what questions that information could answer. The major task then would be to use the RLA money and staff to acquire/create these additional data layers for the whole drainage basin.

Role of the State

State government participants include: CBLAD, DCR, DOF, DGIF, DHR, MRC, VDACS, VIMS and VDOT

Virginia has staff serving on the RLATF and its Technical Workgroup. As the product evolves and as a determination is made as to the critical data layers that will be needed, Virginia may develop a multi-agency Task Force that will cooperatively assist the Commonwealth's committee point contacts with assembling/ updating various Virginia data-sets on resource lands.

Virginia has already identified a number of GIS data layers and statistical survey techniques in place that are being used to provide a preliminary RLA. DCR has made its DTP endorsed "Protected Natural, Historic, and Cultural Lands Layers" GIS database available to identify data layers that can be used to quantify lands currently held by the USDOD, USFWS, USFS, NPS, TNC, DCR, DOF, DGIF, Tribal governments, and land trusts in Virginia. State agencies, in cooperation with other public bodies, are currently developing layers for VOF, CREP, and Forest Legacy holdings; historic easements; and local recreation areas as identified in the Virginia Outdoors Plan (VOP) update surveys that might also be used in this analysis. Existing statistical surveys that will supplement the GIS analysis include the DOF's 7th Forest Inventory Analysis which was conducted in cooperation with the USFS and will be completed in 2002, and the USDA-Agricultural Statistics Service's Agricultural Census of Virginia. DCR also has several data sets on hand that will facilitate resource identification and prioritization such as its Natural Heritage Biological and Conservation Information System, various Soil and Water data sets, and data being compiled around the VOP. VDOT performs farmland surveys during road alignment studies to determine whether potentially affected sites constitute "prime or unique farmland" subject to the Farmland Protection Act.

Progress and Outlook

Although substantial progress has been made on defining the approach, limited work has ensued on selecting pilot areas, assembling existing information for these areas, building necessary data layers, and determining what new layers may need to be developed. Completion of a Pilot Product by December of 2001 may be an overly ambitious goal.

Additional Efforts

Virginia will continue to participate in both the CBP's RLATF and the associated Technical Workgroup and will monitor the necessity to develop a Virginia multi-agency Task Force to address specific data needs. Virginia will also participate on the Land

Data, Land Conservation, and Forestry Workgroups that may also be working on aspects of this commitment.

4.1.2 *Provide financial assistance or new revenue sources to expand the use of voluntary and market-based mechanisms such as easements, purchase or transfer of development rights and other approaches to protect and preserve natural resource lands.*

Approach to Implementation of the Commitment

Public bodies and private land conservation organizations throughout the Bay Watershed will work together to continue, and to enhance where reasonable, programs related to the purchase of easements and the purchase or transfer of development rights. Some additional legislative authority may be needed within the Bay jurisdictions to effectively employ all the prospective tools that might be used to meet this commitment.

Role of the State

State government participants include: CBLAD, DCR, DGIF, DOF, TAX, VDACS and VOF

There are a number of existing and well-received easement programs among both State agencies and private sector organizations in Virginia. The first part of this commitment focuses on the identification of existing preservation programs and packaging them so that they are available as a cohesive public information product. A synthesis of these programs was presented in 2000 in a VOF/DHR/DCR report entitled "Conservation and Historic Easements in Virginia". This portfolio, of federal, state, local and non-profit funding programs and techniques, identifies programs that may help address this commitment. These sources will be compiled by DCR's Land Conservation Office into a web listing, "A citizens guide to land conservation programs", that will link to numerous other web locations for further detailed information. The State will also continue to partner with the Virginia United Land Trust (VaULT), an organization whose membership includes many of the Commonwealth's land trusts, to synergistically promote land conservation programs. The State will explore in cooperation with the land trusts whether common easement criteria/ standards can be developed.

The second part of this commitment speaks to the development of new revenue sources to expand the use of voluntary and market based mechanisms to preserve land. Virginia recognizes that continued philanthropic giving of easements to organizations like the Virginia Outdoor Foundation and the further refinement of tax incentives that fuel these donations by private citizens and Foundations is one of the best ways to address this commitment. In 2000, the Virginia Land Conservation Foundation under its Code requirements, in coordination with Department of Agriculture under its Appropriation Act requirements, drafted procedures for the funding of purchase of development rights (PDR) programs. These grant processes for PDRs, in concert with localities' self-financed PDR programs, will also provide additional revenue for land protection. Utilizing state funding and additional funding from program cooperators, a portion of the

lands enrolled in the Conservation Reserve Enhancement Program will be targeted for the placement of permanent easements over the course of the next few years. The U.S. Forest Service's Forest Legacy Program administered through the Department of Forestry is also adding to the list of available conservation easement or fee simple purchase programs in Virginia. The Chesapeake Bay Preservation Act (CBPA) program continues to provide a level of protection for resource lands along streams and open water by requiring the local designation of Resource Protection Areas (RPAs) throughout Tidewater Virginia.

Should the Conservation and Reinvestment Act of 2001 (CARA) be passed by Congress before the end of 2001, Virginia could stand to receive as much as \$51 million in revenue for conservation activities. Of this amount, almost \$8 million will be available annually for grants through the stateside of the Land and Water Conservation Fund Program that since 1965 has provided over \$70 million in revenue for land conservation activities in Virginia.

Progress and Outlook

With no specified deadline for this commitment, it appears the Commonwealth can meet the intent with a continuation of existing programs.

Additional Efforts

Virginia, in coordination with the CBP's Tax Assessment Workgroup, will identify potential changes or additions to tax or other incentive laws that may facilitate the expanded use of voluntary and market-based mechanisms such as easements, purchase or transfer of development rights and other approaches to protect and preserve natural resource lands.

4.1.3 *Strengthen programs for land acquisition and preservation within each state that are supported by funding and target the most valued lands for protection. Permanently preserve from development 20 percent of the land area in the watershed by 2010.*

Approach to Implementation of the Commitment

The primary element of this commitment speaks to preserving 20% of the land area in the watershed. In an effort to determine what portion of the watershed was already preserved, Bay jurisdictions and partners developed a working definition of "preserved lands" and developed a baseline listing and acreage total of properties that met the definition as of June 30, 2000. In February of 2001 the CBC and the Trust for Public Land, building on the Bay Program's efforts, released a report entitled "Keeping Our Commitment; Preserving Land in the Chesapeake Bay Watershed". Based on the jurisdiction's preliminary June 30, 2000 baseline calculations, the CBC's report estimated that to reach the 20% goal, an additional 1.1 million acres needed to be preserved by 2010. Of this 1.1 million acres, it was estimated that 28.5% could be protected through private donation and nonprofit activity, leaving around 786,000 acres to be protected through public funding efforts. Using an average cost per acre, they estimated that \$1.8

billion in public funds over 10 years would be required to protect the 786,000 acres. Since determining this need for funding, the CBC has been pursuing increased funding for these activities from federal sources in various pieces of federal legislation.

To calculate the progress toward achieving the goal, the June 30, 2000 baseline numbers have been refined and tentatively adopted by the CBP and jurisdictions are completing their first annual report which will include refinement to the baseline and a listing of properties and their acreage preserved between July 1, 2000 and June 30, 2001. To continue to address issues related to this and other land conservation commitments, the CBP has developed a Land Conservation Workgroup under the LGSS. The workgroup will develop an overall work plan for: monitoring progress on these commitments; implementing tasks and projects, and; creating and implementing specific strategies for particular commitments as needed. The workgroup, in particular, will develop/adopt and implement a strategy to permanently preserve from development 20 percent of the land area in the watershed by 2010.

Role of the State

State government participants include: CBLAD, DCR, DGIF, DHR, DOF, VCLF, VDACS, VIMS and VOF

The first role of the state is to aid in monitoring Virginia's progress towards this Bay-wide commitment. DCR will utilize its "Protected Natural, Historic, and Cultural Lands Layers" GIS database to track and quantify lands preserved within the Commonwealth. It will be necessary for State and federal agencies in partnership with DCR to create annual updates to the data layers those agencies maintain on lands held within the Commonwealth. DCR's Land Conservation Office will also regularly coordinate with Virginia's land trusts and localities to monitor preservation progress by these groups. The second role of the state relates to strengthening land conservation programs. With the existence of the Virginia Land Conservation Foundation (VLCF), the Virginia Outdoor Foundation (VOF), the Forest Legacy program, the Federal Land and Water Conservation Fund program and host of other federal, state, local, and private preservation programs, Virginia already has the infrastructure developed to protect the Commonwealth's lands. Passage of CARA as mentioned in 4.1.2, would also provide Virginia with up to \$51 million in additional revenue to be used for conservation purposes.

The remaining role of the state in this commitment relates to targeting its programs towards the most valued lands. One mechanism Virginia will employ to target its acquisition programs and dollars toward the most valued lands is through the VLCF which splits its funding through a ranking process equally among four uses: natural area protection; open spaces and parks; farmlands and forest preservation; and, historic area preservation. Additionally, the Code of Virginia calls for VLCF to seek a fair distribution geographically of land protected throughout the Commonwealth. A continuation of this funding formula and distribution technique will ensure that dollars are being expended on the most valued lands and that the entire Commonwealth may equally benefit. VLCF also is responsible for developing a "needs assessment" (strategic

plan) for future land preservation targeting efforts that will cohesively synthesize those properties and needs identified in the Virginia Outdoors Plan, the Virginia Natural Heritage Plan, the Virginia Institute of Marine Science Inventory, the Virginia Joint Venture Board of the North American Waterfowl Management Plan, the Virginia Board of Historic Resources Inventory, and any other inventories, plans, priorities, or initiatives provided by the DACS or DOF. It has been determined that Virginia's Outdoor Plan (VOP) will serve as the VLCF's and the Commonwealth's strategic plan for land preservation. As an enhanced component of the VOP, the state will partner with the Virginia United Land Trust to develop through a series of regional meetings the framework for a land trust land conservation/ preservation plan.

Progress and Outlook

Virginia has made excellent progress in the last year relative to this commitment and will continue to excel in the coming years. The Commonwealth has the capability to accurately identify and track its preserved lands and the programs in place to protect the lands within the Commonwealth. Additionally, Virginia's Outdoor Plan that is updated every five years is due out before the end of 2001.

Additional Efforts

Virginia must continue to seek federal funds to assist with land preservation efforts and enhance our programs to educate landowners on opportunities available to them to protect their lands from future development and to keep them as working open space. Funding for the VLCF and VOF during the next biennium should also be considered.

4.1.4 *Provide technical and financial assistance to local governments to plan for or revise plans, ordinances and subdivision regulations to provide for the conservation and sustainable use of the forest and agricultural lands.*

Approach to Implementation of the Commitment

Primary activities related to this commitment will need to be addressed at the state level. However, the Bay Program can be a conduit for information related to this commitment. The Local Government Advisory Committee is currently designing the Bay Local Government Information Network, or Bay LOGIN, the electronic network for local governments in the watershed. It will provide an electronic link between local governments and the Bay Program. Services provided on the network may include: Land Use; Watershed Management Planning; Land Preservation; Environmentally Sensitive Design; Maps/GIS Analysis; Model Codes/Regulations/Programs; Sound Land Use; Best Management Practices; Habitat Restoration/Preservation; Riparian Buffer; Stormwater Management; and Wetlands Restoration/Preservation information to name a few categories. Information provided on this website will address elements of this commitment.

Role of the State

State government participants include: CBLAD, DCR, DGIF, DOF and VDACS

State agencies need to coordinate on the implementation of this commitment to assure that they are not working at cross-purposes. To efficiently address this commitment, the Commonwealth will establish a multi-agency task force to identify existing programs that provide technical and financial assistance to local governments for land planning and to identify gaps between these programs that need to be addressed. In cooperation with local governments, the task force will research potential Code of Virginia and Virginia Administrative Code additions or modifications, as well as local ordinance updates, that may provide for the conservation and sustainable use of forest and agricultural lands. The task force will also focus on the existing Agricultural and Forestal Districts Act in Title 15.2 and the Special Assessment for Land Preservation in Title 58.1 of the Code of Virginia. The group will investigate opportunities to enhance educational programs for local officials on the issues related to the viability of the agricultural economy and on how land use management programs can affect and even improve that viability.

Traditionally, local land use management programs do not address agriculture and forestry, except under the Chesapeake Bay Preservation Act. Some localities have Use Value Taxation programs, often connected to designations as Agricultural and Forestal Districts, to provide resource land owners with tax breaks if they meet certain conditions. One goal of these programs is to preserve these lands for resource production. Helping to maintain the economic feasibility of farming and forest management helps prevent the conversion of farmland and forest land to other uses. VDACS has programs in two primary areas to help maintain the viability of Virginia agriculture. The first area includes marketing programs that assist farmers in the identification and development of domestic and international markets for their products. The second set of programs seeks to attract new agricultural ventures to Virginia that range from farms, to processors, to all of the related types of businesses that facilitate the expansion of existing Virginia agricultural businesses (farms, processors, etc.).

Progress and Outlook

At this time, progress specific to this commitment has been limited. Achieving this commitment could be a very technical and labor intensive exercise and will likely take a long time, with gradual incremental advances being made. Pursuing changes to state and local laws, regulations, ordinances, and plans will require activity well beyond 2002.

Additional Efforts

Once the approach is clearly delineated by the task force, additional resources may be needed.

4.1.5 In cooperation with local governments, develop and maintain in each jurisdiction a strong GIS system to track the preservation of resource lands and support the implementation of sound land use practices.

Approach to Implementation of the Commitment

This commitment will primarily be implemented at the state/local level with the Bay Program providing modest support through the activities of the Land Data Workgroup

and the Land Conservation Workgroup under the guidance of the Land, Growth and Stewardship Subcommittee. The Bay Program may also be in a position to produce additional information that would supplement a state/local GIS system through the development of a Chesapeake Resource Lands Atlas, a report document with maps that would characterize the status, trends, and condition of resource lands. The report would address extent, location, and change of resource lands and indicate areas of high value and vulnerability. The Bay Program's efforts would also result in the production of: 1) a series of environmental indicators that reflect resource land issues related to water quality, habitat, and economic factors for the 11-digit watersheds of the Chesapeake Bay basin; 2) a map set of forest, farmland, and wetland areas that contain important ecological and economic features, and those that are vulnerable to conversion or degradation; and 3) a technical report that describes the analysis products and interpretation of findings.

Role of the State

State government participants include: CBLAD, DCR, DGIF, DHCD, DOF, VGIN and VMRC

To meet this commitment, Virginia will utilize its "Protected Natural, Historic, and Cultural Lands Layers" database. DCR will continue to coordinate with local governments to track their preservation of resource lands and add these to that comprehensive database. Localities and planning district commissions (PDCs) will have web based access to these layers for their use in local planning efforts. In addition to working with localities and PDCs, DCR's Land Conservation Office will also work with non-profit conservation organizations to capture their preservation activities. DCR will work with state and federal agencies to develop a mechanism to cooperatively ensure that updates to the data layers in the protected lands database are regularly provided. An additional source of coordination and assistance to the localities is the DHCD. All funding allocations for PDCs pass through DHCD's budget. DHCD has provided support to each of Virginia's PDCs to acquire or improve GIS systems. In turn, the PDCs have provided GIS and land planning support to their local government partners.

Progress and Outlook

This commitment will necessitate a great deal of coordination amongst federal, state, and local entities using GIS. This will be an on-going effort, with data sets needing to be updated and exchanged periodically. The state has recently added positions to address data coordination with land trusts and localities, to coordinate preserved lands layer development, and to make preserved lands information available via the internet. The Commonwealth is and will continue to make significant advances on the GIS front and will coordinate these advances with the localities and PDCs.

Additional Efforts

Expanded resources might include the addition of several more GIS technical specialists.

4.2 Development, Redevelopment and Revitalization

A number of state agencies have responsibilities and programs that relate directly to the implementation of the commitments in subsection 4.2 of the agreement. The two agencies that are most heavily involved are the Chesapeake Bay Local Assistance Department and the Department of Conservation and Recreation. To clarify this particular subsection, brief descriptions of the roles performed by the agencies primarily responsible for the implementation of commitments in subsection 4.2 are provided below.

Chesapeake Bay Local Assistance Department (CBLAD)

CBLAD is charged under the Chesapeake Bay Preservation Act with operating within the area legally designated as "Tidewater Virginia" which consists of 84 jurisdictions (counties, cities and towns) lying mostly east of Interstate 95. In addition, the agency has assisted several counties outside of that designated area that have decided to employ the approach laid out in the Act. Where they apply the Act and its associated regulations provides an integrated approach to land use management for the purpose of water quality protection.

The core of the Act is the designation and use of Chesapeake Bay Preservation Areas which, in turn, involves the designation of Resource Protection Areas (RPAs) and Resource Management Areas (RMAs).

Resource Protection Areas include land types that are adjacent to water bodies with perennial flow and have an intrinsic water quality value due to the ecological and biological processes they perform or are sensitive to impacts that may result in significant degradation to the quality of state waters. Examples are tidal shores, tidal and nontidal wetlands, and steep slopes near the water.

Resource Management Areas include land types landward of Resource Protection Areas that, if improperly used or developed, have a potential for causing significant water quality degradation or for diminishing the functional value of the Resource Protection Area. Examples are flood plains, highly erodible soils, highly permeable soils, and isolated nontidal wetlands.

Eleven of 29 counties, two of 17 Cities, and 21 of 38 Towns in Tidewater Virginia have designated their entire jurisdictions as Chesapeake Bay Preservation Areas, and four more Counties and one Town have done the same but provide an opt-out provision if the site does not include any Resource Management Area features. In addition, two Counties, three Cities and 11 Towns have smaller RMAs, but implement key performance criteria, such as stormwater management requirements, jurisdiction-wide. Finally, three Counties, three Cities and three Towns designated their entire Chesapeake Bay watersheds as Chesapeake Bay Preservation Areas, but not the parts of their jurisdictions that drained elsewhere. Therefore, a total of 34 Counties, 8 of 17 Cities, and 35 of 38 Towns have some form of jurisdiction-wide or watershed-wide CBPA designations.

The Chesapeake Bay Preservation Act primarily addresses:

- Designation of Chesapeake Bay Preservation Areas (CBPA's) into local comprehensive plans, land development ordinances, and zoning and subdivision ordinances.
- Adoption of required performance criteria that protect water quality within CBPA's.
- Buffer Area requirements.
- Septic Pump-out requirements.
- Erosion and Sediment Control requirements that exceed state code standards.
- Agricultural and Forestry water quality protection requirements including soil and water conservation plans.
- Grant program for local government implementation of the Bay Act.
- Mandatory water quality stormwater management regulations in CBPA's.

Additionally, the agency is involved in the following Bay agreement-related voluntary programs and activities; Better Site Design Initiative, Low Impact Development education and training, and environmental education and outreach.

Department of Conservation and Recreation (DCR)

DCR operates on a statewide basis. Consequently, it carries out activities throughout the Virginia portion of the Chesapeake Bay watershed. The agency implements or has oversight responsibilities for a number of programs and activities that relate to the implementation of the section 4.2 commitments. Those programs and activities are as follows:

- Development, publication and dissemination of the technical manuals that govern and provide the standards for all urban site design and land use activities involving soil and water management.
- Erosion and sediment control law and programs for local governments, with oversight from the Virginia Soil and Water Conservation Board. A related function is the review and approval of the annual statewide erosion and sediment control plans for road construction (VDOT) and utility lines.
- Stormwater management law and programs, with oversight by the Virginia Board on Conservation and Recreation, wherein localities may pass ordinances requiring stormwater management.
- Training programs and certification of erosion and sediment control Program Administrators, Inspectors, Plan Reviewers, and Responsible Land Disturbers. To date, over 10,000 persons hold a DCR certification and must uphold the associated, technical, land disturbing standards.
- Periodic comprehensive reviews of local governments' urban nonpoint source control programs, to include a rating system and corrective action plans.
- Operation of the state's tracking system for urban best management practices and associated pollution reductions.
- Grants to local governments under the Water Quality Improvement Act to carryout local pollution control programs and projects.
- Grants to Soil and Water Conservation Districts to carryout local conservation programs.

- Development of “cooperative nonpoint source programs” under the Water Quality Improvement Act to comprehensively address water quality needs through local ordinances, programs, and strategies.
- Operation of Watershed Conservation Roundtables with representatives from each local government within a basin, to bring a watershed-wide perspective to the management of water resources.
- Implementation of Virginia’s floodplain management programs.
- Operation of GIS and Virginia’s designated tracking systems to record all Chesapeake Bay nonpoint source pollution factors and reductions.
- Nutrient management law and certification program, providing standards for the management of urban public lands as well as agricultural operations.
- Annual conference dedicated to educating local government officials about land use, watershed management, and low impact development.
- Dozens of field days and related training opportunities to improve citizen awareness of stormwater management, residential turf management, public land management, nutrient and pesticide management on golf courses, and landscaping techniques to reduce runoff.

4.2.1 *By 2012, reduce the rate of harmful sprawl development of forest and agricultural land in the Chesapeake Bay watershed by 30 percent measured as an average over five years from the baseline of 1992-1997, with measures and progress reported regularly to the Chesapeake Executive Council.*

Approach to Implementation of the Commitment

This commitment will be implemented by identifying barriers to, and opportunities for, promoting sound land use, strengthening programs promoting sound land use (including those other commitments which will help achieve this), and finally, providing technical and financial assistance to targeted audiences to promote environmentally sensitive new development and redevelopment.

Since this commitment is to be measured on a watershed wide basis, the tracking system will be created, maintained, and operated within the Bay Program. Because development activity is to be tracked, there may be a need for locality specific information that may have to be provided by, or through, the Commonwealth. In the year 2007, the first assessment for progress will be accomplished and in 2012, the final data collection and assessment will occur.

Role of the State

State government participants include: CBLAD, DCR, DEQ, DOF and DHCD

The state has the lead on this commitment within the CBP, and the state agencies noted above are carrying out a number of programs and activities that contribute to the implementation of this commitment. However, local governments will do the major portion of the implementation of this commitment. Virginia also participates in the Development, Redevelopment and Revitalization workgroup, a subset of LGSS, which is

charged with developing a strategy to meet this commitment. The workgroup has developed draft parameters for the commitment, a definition of harmful sprawl, a baseline determination and a direction for a tracking system. The jurisdictions have yet to agree on the definition of harmful sprawl and the tracking methodology. The critical initial element to this commitment is defining and tracking the reduction of “harmful sprawl”. Virginia will not be required to provide or maintain a separate data system but may have to provide some data. The Commonwealth will need to develop and implement measures to reduce “harmful sprawl” development (however defined) of agriculture and forested lands to accommodate a fair share of the 30 percent target.

Progress and Outlook

The outlook for this commitment will greatly depend on the type of tracking system developed and definition of “harmful sprawl”. If a workable definition of harmful sprawl can be agreed upon, progress can be made in promoting development within Virginia that would not be considered “harmful sprawl”, (i.e., environmentally sensitive development). If, however, this commitment reverts to the reduction of land conversion from agricultural and forested lands to developed lands, based on the NRI data, progress will be very slow. Virginia does not currently have mechanisms in place to manage or affect significant changes in the rate of land conversion.

Additional Efforts

Significant resources will be necessary to effect change on this scale within Virginia. Technical assistance will be critical to promoting sound land use and environmentally sensitive designs. Virginia also would benefit greatly from a coordinated approach to this effort with land use planning expertise directed to provide technical assistance to the development community.

4.2.2 *By 2005, in cooperation with local government, identify and remove state and local impediments to low impact development designs to encourage the use of such approaches and minimize water quality impacts.*

Approach to Implementation of the Commitment

This commitment will be achieved through a cooperative effort by state agencies, PDC’s and local governments. In addition to education and outreach efforts, forums for discussion among stakeholders, including state agency representatives, the development community and local officials will need to be held, incentives for encouraging low impact design and other approaches will need to be developed, and actual state and local code changes will need to be enacted.

Role of the State

State government participants include: CBLAD, DCR, DEQ and VDOT

Virginia agencies are carrying out a number of programs and activities that contribute to the implementation of this commitment. Those efforts include programs that encourage the use of low impact design and better site design through work with community groups,

the development community, and localities. Some programs have specifically begun to address the identification and removal of impediments to low impact development and minimization of water quality impacts. Other programs provide training and technical assistance services to promote the use of bio-retention as a low impact development technique.

Progress and Outlook

Progress on this commitment seems feasible since many of the initiatives required to accomplish this task coincide with initiatives already in progress. The difficult task will be the accomplishment of state and local regulatory changes that will have to occur in order to remove impediments for environmentally sensitive designs.

Additional Efforts

A strong commitment from Virginia's Executive and Legislative branches as well as local governments will be necessary to accomplish the incentives for regulatory changes that will need to occur at the state and local levels. Additional financial resources may be needed to accomplish this commitment on a large scale throughout the Bay Watershed.

4.2.3 *Work with communities and local governments to encourage sound land use planning and practices that address the impacts of growth, development and transportation on the watershed.*

Approach to Implementation of the Commitment

The current approach to this commitment is composed of efforts by a variety of state programs which address portions of this issue including land use management, comprehensive plan requirements, better site design programs, local erosion and sediment control and stormwater management program reviews, watershed conservation roundtable organizations, low impact development workshops, transportation planning initiatives, and others, etc. However, to fully achieve implementation of this commitment, a more structured and systemic, cooperative state-local partnership would need to be developed to address the impacts of growth, development and transportation on the watershed. A strategy would need to be developed and implemented to work with local governments to encourage low impact development designs; encourage the concentration of new residential development in areas supported by adequate water resources and infrastructure; encourage sound land use and practices that address the impacts of growth, development and transportation in the watershed; and promote redevelopment.

Role of the State

State government participants include: CBLAD, DCR and DEQ

The state has the lead on this commitment and the agencies noted above are carrying out a number of programs and activities that contribute to the implementation of this commitment. Those efforts include the Chesapeake Bay Preservation Act criteria for sound land use management which have been incorporated into the guidance and

requirements for comprehensive plans and land management ordinances of Tidewater localities; local program review process, training and certification, and technical assistance to mitigate and minimize the environmental impacts of development throughout the Commonwealth. However, Virginia has no comprehensive statewide or Bay watershed-wide approach to sound land use planning and practices which fully address the impacts of growth, development and transportation on the watershed.

Progress and Outlook

Some progress on this will occur through existing programs. However, a cooperative approach would be necessary to encourage sound land use planning and practice within the entire Bay Watershed.

Additional Efforts

A state-local partnership and state strategy must be developed to implement this commitment. Financial and technical assistance for Better Site Design, Low Impact Development, adequate public infrastructure, cluster/village development designs, open space conservation development, transit planning, and other land use planning and transportation planning techniques will be essential. Incentives for local government's to incorporate these measures and implement changes to their planning practices will also be critical.

4.2.4 By 2002, review tax policies to identify elements which discourage sustainable development practices or encourage undesirable growth patterns. Promote the modification of such policies and the creation of tax incentives which promote the conservation of resource lands and encourage investments consistent with sound growth management principles.

Approach to Implementation of the Commitment

A Commission on Virginia's State and Local Tax Structure for the 21st Century issued its report to the Legislature in December 20, 2000. That report and its recommendations are currently under review by the Virginia Commission on Growth and Economic Development. The initial work of this Commission is to be completed by November 30, 2001 with a report submitted for consideration by the 2002 General Assembly. In addition, the Governor's Commission on Finance Reform for the 21st Century had its initial meeting in July 2001. These activities will provide policy direction on tax reform on many issues and will include the subject of this commitment.

Notwithstanding the above activity, in order to specifically address this commitment, by 2002, a workgroup involving the Department of Taxation, key members of the General Assembly, and other entities participating in the State Land Evaluation Council, the Virginia Association of Assessing Officers, and the Commissioner of Revenue's Association, will review tax policies and their elements that discourage sustainable development practices or encourage undesirable growth patterns. To assist in this effort, they should be able to draw from the tax policies study that is being carried out under the Bay Program and which is to be available in 2002. The workgroup should also identify

potential legislative or regulatory modifications to the identified policies and promote the modification of such policies and the creation of tax incentives, which promote the conservation of resource lands and encourage investments consistent with sound growth management principles. In addition to identifying problem areas, the workgroup should identify and promote existing special tax credits and deductions that relate to the Bay. These might include the Riparian Tax Credit; Agricultural Best Management Tax Credit; The Advanced Technology Pesticide and Fertilizer Application Equipment Tax Credit; Conservation Tillage Equipment Credits; Land Preservation Tax Credits; Open Space and Recreation Check Off; Chesapeake Bay Restoration Fund Check Off; and Neighborhood Assistance Credit, to name a few.

Role of the State

State government participants include: CBLAD, DCR, DOF, TAX and the State Land Advisory Council

The state has the lead on this commitment. The Commonwealth has, in recent legislative sessions, adopted enabling legislation to accommodate tax credits associated with water quality improvement such as the erosion control and riparian buffer credits. The Commonwealth also accommodates land value taxation for agricultural and forestal lands. While the Commonwealth provides these tools, implementation occurs at the local level. To assist local assessors and governing bodies in these matters, the Commonwealth provides administrative tools and guidance that is available in hard copy and Internet. The Commonwealth will continue in this education and assistance role.

Expanding these tax policy efforts to address “elements that discourage sustainable development practices or encourage undesirable growth patterns” and to “promote the modification of such policies” and “encourage investments consistent with sound growth management principles” can, currently, only be address by the Commonwealth through policy guidance absent any significant and wholesale change to Virginia’s state and local tax structure.

Progress and Outlook

Much of the identification and evaluation phase of this effort will occur prior to December 31, 2002, with identified changes to the Code of Virginia and related tax policies expected in subsequent years.

Additional Efforts

Tax incentives and economic development incentives may become important in the effort to redevelop “Brownfields”. In addition, there is need to complete a review of the application of the tax incentives in the Bay localities. Once this review is completed by the workgroup, they will develop a promotional strategy highlighting the benefits and strategies for implementation. Staff with expertise in this field will be needed for the promotional efforts. As part of this exercise, the Manual of the State Land Evaluation Advisory Council should be republished as technical assistance materials.

4.2.5 *The jurisdictions will promote redevelopment and remove barriers to investment in underutilized urban, suburban and rural communities by working with localities and development interests.*

Approach to Implementation of the Commitment

The approach to implementation of this commitment is currently addressed through existing programs such as the administration of the Enterprise Zone Program, Derelict Structures Program, and the “Brownfields” program. There have been recommendations to the Governor for five additional enterprise zones and processing of enterprise zone tax credit and job grant applications from businesses within the existing 52 zones that have created new jobs and made investments in distressed areas. To meet this commitment, Virginia must provide more incentives for redevelopment and identifying and removing barriers. This will require a comprehensive review of current incentives and barriers by the appropriate state agencies and in cooperation with local governments.

Role of the State

State government participants include: CBLAD, DCR, DEQ and DHCD

The state has the lead on this commitment. While there is no formal coordinated approach to this commitment, the agencies noted above are carrying out a number of programs and activities that contribute to the implementation of this commitment. Those efforts include the Enterprise Zone and the Derelict Structures Program, which can be used to stimulate redevelopment of distressed areas. EZ Program provides state incentives to businesses that create new jobs and investment. Zones are geographically designated areas that are distressed and have been identified as having special economic needs. A significant number of these zones are in the Chesapeake Bay watershed. The intent of these zones is to direct new economic activity to underutilized, distressed areas. The Derelict Structures Program provides grant funds to local governments to acquire, rehabilitate, stabilize or demolish structures that have a blighting influence. Addressing these derelict structures makes them available for redevelopment opportunities.

Progress and Outlook

The programs discussed above are ongoing and can continue to be promoted in attracting economic development and providing certain incentives that result in achievement of this commitment. To meet this commitment, Virginia must provide more incentives for redevelopment and identifying and removing barriers. This will require a comprehensive review of current incentives and barriers by the appropriate state agencies and in cooperation with local governments.

Additional Efforts

Additional efforts required will include additional and expanded incentive programs and financial and technical assistance for redevelopment efforts. There will need to be support from the General Assembly to accomplish this commitment.

4.2.6 *By 2002, develop analytical tools that will allow local governments and communities to conduct watershed-based assessments of the impacts of growth, development and transportation decisions.*

Approach to Implementation of the Commitment

State agencies will continue to work with GIS data bases and applications and other modeling tools and refine them to improve the ability of localities to make wise decisions, develop effective plans pertaining to land use, coordinate and facilitate nonpoint source pollution control programs at the local level, and provide support to community watershed organizations to promote water quality stewardship in subwatersheds. As agencies conduct more systematic transportation planning, incorporating mass transit options along with roadway improvements, they will provide local governments and PDCs with their findings and recommendations pertinent to local long-term transportation planning. In this regard, agencies will no longer simply respond to local requests for transportation project funding, but will instead begin to attempt to influence the direction of local transportation planning in ways that will help to achieve this commitment.

Role of the State

State government participants include: CBLAD, DCR, DEQ and VDOT

Since the CBP's Land Growth and Stewardship Subcommittee has the lead on this commitment, Virginia state agencies are working within the subcommittee and its workgroups to develop better tracking tools for the impacts of growth, development and transportation decisions in the Bay Watershed. Virginia will promote among local governments the use of analytical tools for conducting watershed-based assessments of the impacts of growth, development and transportation and to understand and predict the probable impacts and outcomes of alternative development scenarios.

Progress and Outlook

The current activities of state agencies will not result in comprehensive, consistent tools for local governments to conduct watershed-based assessments of the impacts of growth, development and transportation decisions. Its possible that some of the tools developed by the Bay Program will assist in this effort and provide more consistent tools to be utilized through the Bay Watershed.

Additional Efforts

Additional resources will be needed to support the development of analytical tools to support watershed planning and growth/development impact analysis. These tools should be consistent throughout the Bay Watershed and should be transferable between local governments and regions. Incentives for local participation will also be critical.

4.2.7 *By 2002, compile information and guidelines to assist local governments and communities to promote ecologically-based designs in order to limit impervious*

cover in undeveloped and moderately developed watersheds and reduce the impact of impervious cover in highly developed watersheds.

Approach to Implementation of the Commitment

Various state agencies promote the implementation of ecologically based designs and practices to reduce the water quality impacts of impervious cover in highly developed watersheds and limit impervious cover in undeveloped or moderately developed watersheds. Agencies will continue to educate localities, developers, site designers, and plan reviewers in the techniques (including low impact development) required to minimize and mitigate the “harmful” effects of development. Agencies will continue to provide technical assistance to localities developing stormwater management plans to cost-effectively mitigate and minimize the “harmful” effects of new and existing developments. Watershed based approaches to local land use planning are promoted as the foundation of ecologically based land use plans.

Virginia is actively participating in the clearinghouse of community resources within the Chesapeake Bay Watershed being developed by the Bay Program for just such an effort. This clearinghouse will provide guidance documents, financial and technical assistance, policy documents, watershed planning information, model ordinances and other information to help local governments promote ecologically based designs.

Role of the State

State agencies involved: CBLAD, DCR, DEQ and VDOT

While no formal coordinated approach to this commitment has been developed, the agencies noted above are carrying out a number of programs and activities that contribute to the implementation of this commitment. Those efforts include continued enforcement of requirements for limiting impervious cover and reducing the impacts of impervious cover as performance standards for development, promotion of ecologically-based designs that minimize impacts to water quality, continued technical and financial assistance and distribution of educational materials and outreach programs such as better site design program to promote low impact development. Other efforts include erosion and sediment programs, stormwater management programs which help localities minimize impervious cover in developing areas and cooperative non-point source programs under the Water Quality Improvement Act. The last of these is a combination of local, state and federal programs to achieve a systematic means to improve water quality.

Progress and Outlook

The various technical and financial assistance programs to serve the localities as well as basin-wide stormwater management are critical for this commitment. Outreach efforts related to better site design and work on removing impediments to better site design and low impact design initiatives, in particular, should help meet the objectives of this commitment for these localities. Appropriate state agencies could promote local adoption of development incentives towards these ends (i.e., density credits for projects that meet established objectives). Also, recognition programs could be developed or enhanced to

provide public credit to developers who meet the objectives of this and other commitments.

Additional Efforts

Additional resources will be necessary to expand existing programs to fully meet this commitment.

4.2.8 *Provide information to the development community and others so they may champion the application of sound land use practices.*

Approach to Implementation of the Commitment

Key state agencies will continue to provide information to the land development industry to help them negotiate desirable outcomes that result in win-win projects for the localities as well as the builders. This involves striving for the same goals as are discussed in 4.2.2 and 4.2.3. Efforts to expand better site design programs and assist the development community through the provision of technical support and information about erosion and sediment control, comprehensive planning, growth management tools, stormwater management planning, low impact development, sensitive species, habitat, and natural communities will be critical.

Efforts to promote more use of low-impact subdivision street and drainage designs is important as well as programs such as the pre-qualified sites and buildings initiative is a planning effort that should result in providing the development community with sites that not only meet their needs but also reflect the application of sound land use principles by avoiding impacts to sensitive lands and minimizing permit issues for clients. Agencies utilize mailing lists or other means to communicate directly to economic development interests and provide informational publications pertaining to plant communities/animal species/habitat that would be useful to developers in accomplishing sound, environmentally sensitive project plans.

Role of the State

State government participants include: CBLAD, DCR, DGIF and VDOT

This commitment calls for providing information to the development community and others so they may champion the application of sound land use practices. Virginia will utilize many of the tools being developed by the Bay Program for increased outreach to the development community. The other responsibility of the Commonwealth in this regard is for its agencies to continue with their research and program development efforts and to disseminate their findings.

Progress and Outlook

Progress is being made on this commitment through existing state programs, such as better site design work and non-point source programs. Transportation planning requires anyone performing land disturbing activities on the right of way to obtain a responsible

land disturber erosion and sediment control certification and to attend an 8 hour training class prior to performing any land disturbing activities.

The expansion of better site design work will include research on identifying and removing barriers and impediments to LID and Better Site Design. One example includes a grant-funded project to Friends of the Rappahannock to work with localities on targeting and removing impediments. This project includes an education/outreach component to target Planning Commissions and Boards within local governments. One result of this project will be recommended code changes in each of the localities.

Additional Efforts

In order to more completely address this commitment, there needs to be dedicated resources to an education, outreach and technical assistance effort directed at the development community.

4.2.9 By 2003, work with local governments and communities to develop land-use management and water resource protection approaches that encourage the concentration of new residential development in areas supported by adequate water resources and infrastructure to minimize impacts on water quality.

Approach to Implementation of the Commitment

This commitment is strongly linked to Sound Land Use commitments 4.2.4 and 4.2.5, and many of the strategies applicable to those commitments will be applied to this one as well. Agencies will promote watershed-scale and environmentally-based approaches to land use planning. Through its review of local comprehensive plans, state agencies will support local government efforts to concentrate development in areas served by adequate public infrastructure. As a result of cooperative nonpoint source management planning land uses are more likely to be placed where adequate water resources exist. Basin-wide planning activities will incorporate regional approaches to infrastructure assessment.

Source water protection programs may also be applicable to this commitment. The Source Water Assessment Program (SWAP) is the first step in providing the owners of waterworks information concerning the locations of land use activities of concern that may impact their water supply. Currently, there is no mandatory source water protection under the Safe Drinking Water Act. However, the Act should encourage protection activities.

Role of the State

State government participants include: CBLAD, DCR, DEQ, VDACS, VDH and VDOT

The state has the lead for this commitment. The agencies noted above are carrying out a number of programs and activities that contribute to the implementation of this commitment. Baywide efforts include the implementation of effective stormwater management and erosion and sediment control programs and the development of cooperative non-point source programs under the Water Quality Improvement Act in

each locality to reduce water resource impacts. Additional Tidewater specific efforts include the review and update of local comprehensive plans and land management ordinances and implementation of land management practices which minimize water quality impacts from development in Tidewater Virginia.

Progress and Outlook

The general focus for meeting this commitment will be an on-going process of building on the efforts the agencies are already making. There may be the need for improved coordination of programs during the first 1-2 years, but afterwards the focus will be on continued implementation.

Additional Efforts

The existing level of effort can continue with existing resources, as it is a component of the affected agencies general work programs. An acceleration of effort with regard to an assessment and assistance of the application of local policies toward this commitment would necessitate additional manpower and support resources. Perhaps greater local authority will be needed in addition to financial and technical assistance to localities to achieve this.

4.2.10 By 2004, the jurisdictions will evaluate local implementation of stormwater, erosion control and other locally-implemented water quality protection programs that affect the Bay system and ensure that these programs are being coordinated and applied effectively in order to minimize the impacts of development.

Approach to Implementation of the Commitment

There are currently several studies underway that are evaluating the implementation of current stormwater, erosion control and other locally implemented water quality protection programs in Virginia.

The Erosion and Sediment Control (ESC) law and the Stormwater Management (SWM) law mandate that DCR provide regular review and evaluation of the effectiveness of local and state agency implementation of ESC (§10.1-562) and SWM (§10.1-603.12) programs and their consistency with the State Law and Regulations. The scheduled statewide review of local ESC programs, as approved annually by the Soil and Water Conservation Board (SWCB), establishes the schedule for the comprehensive review of local ESC and SWM programs. In 2000, the long-standing audit process was expanded and improved to be more beneficial to localities to help them identify solutions to common site design and program administration difficulties.. It includes data on population, topography, staff certification levels, random site inspections, plan review, effectiveness and overall program administration, to include fees charged. The audit results in a corrective action plan for each locality, noting any deficiencies and the timeline for improvement. Failure to comply with the plan can result in enforcement action by the Virginia Soil and Water Conservation Board. Ratings achieved by each locality in this urban nonpoint source review program can be compiled statewide so that each locality and its citizens know the

relative status of protection efforts conducted by their jurisdiction. In Tidewater communities where the CPBA may apply, local programs are reviewed by DCR in the context of those ordinances. Also, this urban programs audit is the foundation for Virginia's urban nonpoint pollution reduction tracking system, maintained by DCR to help verify the accomplishment of the Tributary Strategy goals.

As well, the Chesapeake Bay Preservation Act (CBPA) requires that the Chesapeake Bay Local Assistance Board ensure that its local programs are being implemented consistent with the requirements of the Act and associated regulations. A local audit process to evaluate existing local approaches to meeting requirements of the Chesapeake Bay Preservation Act is being developed for approval by the Board. This audit process will provide a mechanism of reviewing how each locality implements the Act and Regulations, which are an essential component of locally implemented water quality protection programs in the Tidewater area. A further component of this activity is the development of an annual report format and a process for the review and evaluation of local program annual reports. The audit process will move CBLAD from its compliant based oversight of local program implementation into the type of pro-active oversight role that is expected by the General Assembly and reflected in this commitment.

The prioritization of the DCR/SWCB local program reviews has become a very important issue since preliminary discussions with DEQ indicate that a condition of the VPDES Municipal Stormwater Permit, both Phase I renewal, and Phase 2, may be an "approved" local ESC and SWM program. VDOT, the only state agency with a DCR certified, internally implemented E&S Control Program, will also be more aggressive in the review of its program's consistency and effectiveness.

Role of the State

State government participants include: CBLAD, DCR, DEQ, DOF and VDOT

The Bay States have the lead for this commitment. In Virginia, DCR has responsibility state-wide and Bay-wide, and CBLAD has responsibility in Tidewater for evaluating the local implementation effectiveness of their erosion and sediment control requirements.

Progress and Outlook

Results of the current studies should help to better understand the implementation status of existing programs. Agencies are continuing to evaluate implementation of their respective laws and regulations through their current review processes. Agencies may need additional resources to meet the commitment deadline of 2004.

Additional Efforts

Agencies will need to increase the pace and effectiveness of their cooperative and coordinated oversight of local programs to the degree feasible, based on current resources. These changes should take place over the next 1-2 years and would necessitate a long-term commitment to local program implementation and enforcement. Local programs need the incentives and tools to do a better job as well as additional long term staffing and funding resources. Beyond that, these program reviews and oversight

processes will become routine, based upon an established multi-year cycle for the review of all the programs.

4.2.11 *Working with local governments and others, develop and promote wastewater treatment options, such as nutrient reducing septic systems, which protect public health and minimize impacts to the Bay's resources.*

Approach to Implementation of the Commitment

Several state agencies are involved with the subject of this commitment and have programs that contribute to the implementation of this commitment. An example is the Revolving Loan Fund that communities can use to establish and improve wastewater treatment works and state agency staff to work with and advise localities regarding wastewater treatment options. Another example is the promotion of new septic systems regulations that go further than to reduce nutrient discharges.

Other agencies have an enforcement role with local health departments and as such maintain and update the regulations that govern septic systems. Other requirements include performance criteria specific to septic system design and maintenance.

When biosolids are to be applied to agricultural lands, in most areas, a plan prepared by a DCR certified nutrient management planner governs the process to ensure the agronomic uptake of the nutrients. This reduces the potential for runoff pollution from these sites. Some localities have additional requirements to further restrict the risk of pollution from sludge.

Role of the State

State government participants include: CBLAD, DCR, DEQ, DHCD and VDH

The role of the state for this commitment will be to disseminate information to local units of government so that they may consider and adopt performance standards beyond those enforced by general statutes and regulations. The existing regulatory functions of the DOH and CBLAD provide an avenue of communication for such efforts. Also, through the DEQ Revolving Loan Fund, the Water Quality Improvement Fund, and Community Development Block Grants administered by DHCD technologies and systems that are more responsive to water quality considerations should be encouraged.

Progress and Outlook

VDH has recently finalized amendments of State On-Site Wastewater Treatment Regulations (for septic systems). These amendments will result in a quantum leap in the useful life and water quality/public health protection derived from new septic systems. As well, the regulations include more flexibility pertaining to alternative and innovative on-site treatment systems. CBLAD is also amending its program regulations. The septic system provisions of those regulations are proposed for revision to mirror the applicable flexibilities in the new VDH regulations.

DHCD administers the Community Development Block Grant (CDBG) Program in non-urban areas of the Commonwealth. A significant number of projects funded with CDBG resources involve provision of wastewater treatment systems to low- and moderate-income Households. Many of these households have never had sanitary wastewater disposal systems before. By providing these facilities to households that are not able to afford them otherwise, public health is improved and human waste contamination of the Bay is reduced.

Additional Efforts

Coordination efforts among state agencies should continue to improve and additional funding for grant programs for the installation of new systems is a need.

4.2.12 Strengthen brownfield redevelopment. By 2010, rehabilitate and restore 1,050 brownfield sites to productive use.

Approach to Implementation of the Commitment

Efforts to develop a brownfields and voluntary cleanup program that encourages and provides incentives for program participants are ongoing. By understanding and appreciating the challenges brownfield participants face, the program is finding ways to provide equity to brownfield projects to help level the playing field between greenfields and brownfields.

Role of the State

State government participants include: DEQ, DHCD and VDOT

The state has the lead for this commitment. Virginia's role in strengthening brownfields redevelopment includes facilitation of projects through reasonable regulatory requirements and technical assistance.

Progress and Outlook

Substantial progress is being made in understanding the needs of brownfield participants. Liability, cost, and timeliness are the three primary deterrents to brownfield redevelopment in VA. The program is actively developing ways to mitigate those deterrents through policy review/change and possible legislative actions. The outcome for such progress looks excellent as it is recognized that the critical role it plays in facilitating brownfield redevelopment successes and looks to leverage off of beneficial federal brownfield activities.

Additional Efforts

Additional efforts to help meet the commitments include educating/assisting local governments, continual marketing of program availability, increasing benefits, and working with state agencies to find synergies and focus resources.

4.2.13 *Working with local governments, encourage the development and implementation of emerging urban storm water retrofit practices to improve their water quantity and quality function.*

Approach to Implementation of the Commitment

The CBP's Urban Stormwater Work Group will work with the states and federal agencies to implement commitments of the new Stormwater Directive on government owned lands. One aspect of that directive is to demonstrate new stormwater management techniques on government properties. In addition, various state agencies in each jurisdiction will continue to work with localities in encouraging and assisting the development of comprehensive watershed-wide or locality-wide stormwater management programs that include retrofits.

Role of the State

State government participants include: CBLAD, DCR, DEQ and VDOT

Virginia agencies are taking opportunities to encourage localities to implement appropriate BMP retrofit technologies as part of their comprehensive water quality protection programs. Some state agencies may be able to influence retrofitting through the following mechanisms: the VPDES Permit Program, the Chesapeake Bay Preservation Act, and the Stormwater Management Act.

The urban, nonpoint source local program review process operated under the Board of Soil and Water Conservation and the Board of Conservation and Recreation allows for close interaction and guidance on improving the effectiveness of local stormwater programs. Additional opportunities to encourage the use of emerging practices include: funding priorities within the WQIA implementation; compliance with Minimum Standard 19 of the ESC Regulations; and, compliance with the water quality component of the stormwater management regulations. Broader adoption of stormwater management programs would significantly enhance the success of this commitment.

In addition, the Bay Program has adopted a Stormwater Directive applicable to state and federal government owned lands. This Directive asks state and federal agencies to be a proper example for stormwater management by implementing cutting edge stormwater plans and practices on their own properties. These include demonstrations of effective stormwater retrofits on previously developed sites.

Progress and Outlook

Localities in Tidewater Virginia, as defined by the Chesapeake Bay Preservation Act (CBPA) are required to implement a storm water quality component of their CBPA ordinance. Significant areas of the Chesapeake Bay watershed in Virginia have no such requirement, but may adopt a stormwater management program. The CBPA does not address water quantity issues such as timing releases as does the stormwater management program. The Virginia Stormwater Management Law does not currently require local governments to implement a stormwater management program; it simply provides enabling authority to do so. Over the next three years, the VPDES Stormwater Permit

program will cause an increase in the number of local stormwater management programs outside Tidewater, yet still within the Bay watershed, and therefore increase the opportunities for watershed staff to improve the effectiveness of those programs.

Additional Efforts

Additional resources in the form of staff and grant funding would be helpful in accelerating progress.

4.3 Transportation

4.3.1 By 2002, the signatory jurisdiction will promote coordination of transportation and land use planning to encourage compact, mixed-use development patterns, revitalization in existing communities and transportation strategies that minimize effects on the bay and its tributaries.

Approach to Implementation of the Commitment

The commonwealth will continue to work with local governments, planning district commissions (PDCs) and metropolitan planning organizations (MPOs) to encourage coordination of transportation and land use planning.

Role of the State

State government participants include: VDOT

Under state law in Virginia land use decisions are almost entirely the responsibility of local governments. Therefore, the local governments are the primary level of government to address land use decisions in Virginia. The local governments rely on the planning district commissions (PDCs) and the metropolitan planning organizations (MPOs) to facilitate the coordination of transportation and land use decisions.

Progress and Outlook

The Virginia Transportation Plan is a new approach to transportation project programming. This program document is being finalized and contains to phases of project development: a feasibility phase and capital improvement phase. In addition, VDOT is completing the updating the 1995 Virginia's Statewide Intermodal Long-Range Transportation Policy Plan. This policy-planning document covers a twenty-year planning horizon and takes a comprehensive approach to intermodal transportation activities across the state.

Additional Efforts

Significant resources will be necessary to effect change on this scale within Virginia. Financial and technical assistance will be critical to promoting sound land use at the local level.

4.3.2 *By 2002, each state will coordinate its transportation policies and programs to reduce the dependence on automobiles by incorporating travel alternatives such as telework, pedestrian bicycle, and transit options, as appropriate, in the design of projects so as to increase the availability of alternative modes of travel as measured by increased use of those alternatives.*

Approach to Implementation of the Commitment

Federal TEA-21 provides funding for the Surface Transportation Program, National Highway System, Congestion Mitigation and Air Quality (CMAQ) Improvement Program, transit and advanced vehicle programs, and bike/pedestrian programs. Also, the National Recreational Trails Program Federal Highway Administration funds were awarded by the DCR, as the state trails program administrator, to localities and non-profit organizations across the Commonwealth for the development of motorized and non-motorized trails and trail head facilities.

Role of the State

State government participants: DCR and VDOT

The Commonwealth has adopted a telecommuting policy as a workforce element that is currently being implemented by each state agency. New multimodal studies are being undertaken by VDOT as well as continued support for special grants for advanced vehicle programs and bike/pedestrian programs.

Progress and Outlook

Progress on this commitment seems favorable since many of the initiatives required to accomplish this task coincide with initiatives already in progress. Meeting this commitment will greatly depend on the tracking system need to document usage of the alternatives. Under the Commonwealth's E-Government initiative, State agencies will continue to process over the next several years of implementing necessary policies to meet this commitment through the use of and development of technology.

Additional Efforts

Additional financial resources may be needed to accomplish this commitment on a large scale throughout the Bay Watershed.

4.3.3 *Consider the provisions of federal transportation statutes for opportunities to purchase easements to preserve resource lands adjacent to the rights of way and special efforts for stormwater management on both new and rehabilitation projects.*

Approach to Implementation of the Commitment

VDOT is currently discussing with other state agencies that currently purchase easements and private land trusts, etc., to determine whether lands adjacent to road rights-of-way or state property can be elevated among priorities for purchase of easements using these funding sources.

Role of the State

State government participants include: VDOT

VDOT purchases easements for compensatory mitigation for impacts to streams and wetlands, and habitat preservation. However, purchase of easements purely as a resource land preservation measure has thus far been a low priority for VDOT. VDOT will continue to implement projects in accordance with Virginia's Stormwater Management Law.

Progress and Outlook

VDOT is moving forward with a multi-agency approach to identify potential environmentally sensitive preservation areas for inclusion in project compensatory mitigation proposals.

Additional Efforts

Funding support for Virginia road-building projects is already less than is needed. Diverting funds to purchase land preservation easements and retrofitting roadways with stormwater management features that are unnecessary for project viability would result in further delays in the road-building agenda. Additional financial resources may be needed to accomplish this commitment on a large scale throughout the Bay Watershed.

4.3.4 *Establish policies and incentives, which encourage the use of clean vehicles and other transportation technologies that reduce emissions.*

Approach to Implementation of the Commitment

VDOT provides congestion mitigation and air quality funding to metropolitan planning organizations (MPOS) that are declared air quality non-attainment. Additionally, VDOT is partnering with Virginia Tech and others in the "Smart Road" project between Roanoke and Blacksburg. This research may reveal additional ways that the Commonwealth can achieve cleaner air from our transportation corridors.

Role of the State

VDOT will continue to perform conformity analyses pertaining to transportation plans and programs in the Commonwealth's air quality "non-attainment" and "maintenance" areas. DEQ-Air currently regulates stationary sources and does not directly regulate vehicle exhaust. However, exhaust gas contributions to air pollution are a factor in calculating non-attainment days.

Progress and Outlook

The Commonwealth has made advances in fleet management through the use of alternatively fueled vehicles.

Additional Efforts

Achieving this commitment will probably require significant incentives in the way of tax credits, air permit credits, etc. Significant resources will be necessary to effect change on this scale within Virginia. Financial and technical assistance will be critical.

4.4 Public Access

4.4.1 By 2010, expand by 30 percent the system of public access points to the bay, its tributaries and related resource sites in an environmentally sensitive manner by working with state and federal agencies, local governments, and stakeholder organizations.

Approach for implementation of the Commitment

The CBP's Public Access Work Group has agreed that the 30% increase is based on the number of sites shown in the CBP's new Public Access Guide (completed in 2000). The guide contains a little over 600 sites, 220 of which are in Virginia, this would mean that Virginia would need to provide approximately 66 new access areas by 2010. Access is divided into four major categories beach, fishing, natural area and boating. Initial proposed strategies for meeting this goal include:

- Development of new access facilities on existing public lands
- Acquisition of new access sites for public access
- Directing grant programs towards projects which increase public access
- Providing enhanced technical assistance to localities in the planning and development of access sites
- Creating partnerships with major private corporate land holders which offer public access opportunities

Role of State

State government participants include: DCR, DEQ, DGIF, VIMS, VLCF and VOF

The state's role is both to develop access opportunities through its programs as well as assist in this endeavor at the local level. All of the participants noted above are working toward this commitment either directly through acquisition and development of sites or indirectly through grant and technical assistance programs to localities.

Progress and Outlook

During 2001, the following project have been completed to acquire, develop, or enhance access opportunities in Virginia:

- The Town of Urbana received a VLCF grant to acquire an abandoned marina site to open for public access for boating and fishing.
- DGIF and York County cooperated in the expansion of the Back Creek Park site at Yorktown to provide additional access for boat launching and added a new fishing pier.
- DGIF, VIMS and Accomack Co. cooperated in the development of a new high capacity boat ramp with parking area and a fishing pier at Harborton, on the bay side.

- DGIF and the City of Suffolk coordinated to develop a fishing pier at the Jones Creek ramp site, providing new opportunities for pier fishing at the City's Nike Park.
- Hanover county and DGIF have cooperated to develop a hand launch site on the upper tidal portion of the Pamunkey River.
- The County of Chesterfield received a Virginia Outdoors Fund (VOF) grant to help develop a new riverfront park along the James River.
- The City of Suffolk received a Virginia Outdoors Fund (VOF) grant to build an additional boat ramp at Bennett's Creek Park.

Despite significant accomplishments in the Bay region of Virginia, only 5 of the target of 6-7 new (or enhanced) sites were reached. Finding suitable areas to acquire and obtaining sufficient funds for both acquisitions and/or development of new access sites will continue to be a challenge in meeting this commitment. Without additional resources it will be difficult to meet this commitment.

Additional Efforts

Increased coordination among all the state agencies, local governments and other stake holders will be required in order to meet the 6 sites/year target through 2010. The key element for meeting this target, however will be money. By their very location and nature, the acquisition, development and management of public water access sites is expensive. Depending on the nature of the site and type of access provided, costs can range from \$5,000 for a simple hand carry site to several hundred thousand for a trailer boat launch site, not counting the land cost.

4.4.2 *By 2005, increase the number of designated water trails in the Chesapeake Bay Region by 500 miles.*

Approach for implementation of the Commitment

The state's approach to the implementation of this commitment is two-fold. First, the state is developing designated water trails through efforts of the DCR, and also offers technical assistance to other groups and localities who are interested in trail development. Second, matching grant funds are being made available to localities and interest groups for water trail development.

Role of the State

State government participants include: DCR

This commitment requires the addition of 500 miles of new water trails Baywide by 2005. It will be the state's role to not only develop water trails on its own but to work with river user groups and localities in the development of designated trails.

Progress and Outlook

Virginia added about 125 miles of newly designated Water Trails in 2001. In addition, DCR is funding a water trail project through its trails grant program on the Pamunkey and Mattaponi Rivers. This project, which is being done in phases, will provide nearly

100 miles of water trail when it is totally complete (about half of it is currently under development). The Mattaponi and Pamunkey River Association has received grant funds to develop a York River Water Trail from West Point to the Chesapeake Bay. This project is under way and will be completed in 2002, adding approximately 40 miles of designated water trail. Virginia Beach, Norfolk, Portsmouth and Chesapeake have a significant water trail network under development on the Elizabeth River system. They have applied for NPS Gateways funds and probably will designate this system of 20 to 30 miles next year.

Based on projects already under way, Virginia should easily meet its target of 166 miles of designated water trail by 2005.

Additional Efforts

Following through on the projects underway and working with other proposals that are in the preliminary planning stages will ensure that Virginia exceeds its target by 2005.

4.4.3 *Enhance interpretation materials that promote stewardship at natural, recreational, historical and cultural public access points within the Chesapeake Bay watershed.*

Approach for implementation of the Commitment

Continue the development and distribution of interpretive materials at State owned lands offering public access. This is done on a continuous basis at the DCR's state parks and natural area preserves and at DGIF facilities. It is also done at many sites owned by localities.

Role of the State

State government participants include: DCR and DGIF

This commitment is on going and has no specific numerical target. The State's role will be to continue to develop interpretive and stewardship materials for distribution at public access sites. These can be in the form of new signage, brochures, exhibits and/or programs. Primary locations for these materials are at state parks, natural area preserves, state wildlife management areas and at state owned public boat ramps. Another major way in which this goal will be met is through the development of interpretive material for access sites that become a part of the Virginia Birding Trail.

Progress and Outlook

In the past year, new interpretive exhibits have been developed in a number of the coastal state parks and interpretive programs are offered through out the summer season. In addition, a new water trail guide to the Potomac River has been completed and distributed at appropriate sites along the river. The guide contains important stewardship information. Also, the state has received a grant for the development of new interpretive kiosks at its coastal state parks. These kiosks will be completed and ready for public use next year. Dozens of sites have been selected for the Virginia Birding Trail and as this project is completed sites, as well as the guide for the use of the trail, will contain

appropriate interpretive and stewardship information. This commitment is being met on a continuing basis.

Additional effort

No additional effort is required in this instance. The state, however, needs to continue its process of providing appropriate interpretive material and programs at its public use facilities.

4.4.4 *By 2003, develop partnerships with at least 30 sites to enhance place-based interpretation of Bay-related resources and themes and stimulate volunteer involvement in resource restoration and conservation.*

Approach for implementation of the Commitment

This is a specific element, is tied to the National Park Service's Gateways program. Each site funded by the Gateways program must have place-based interpretation and become a component of the Gateways network. In addition, sites can apply to be a part of the network outside of the grant program. Sites can be identified as Hubs, Regional Information Centers, or Gateways. Therefore, each time a site meets the criteria to become a component of the Gateways network, and it counts towards meeting this commitment.

Role of the State

State government participants include: DCR

The state applies for and receives designation of sites as components of the Gateways network. Each site has a site-specific theme and where appropriate an interpretive linkage to other gateway sites. Virginia (agencies, localities and non-profits) are applying for and receiving designation of sites as Gateways. This designation and development of the interpretive component meets the commitment. Virginia's "share" would be 10 new sites.

Progress and Outlook

The first year of the program (2000), over 10 gateway sites were funded throughout the Bay area of Virginia. In 2001 eight of Virginia's coastal state parks were designated as Gateway sites. There have also been other local and private-non-profit sites that have been designated this year. If Congress funds the program for next year as anticipated, 15 or more additional gateway sites could be added with at least that many more in succeeding years. Virginia's portion of this goal has been met and will be exceeded over the coming years.

Additional Efforts

None at this time.

SECTION 5.0 STEWARDSHIP AND COMMUNITY ENGAGEMENT

SECTION GOAL:

Develop, promote and achieve sound land use practices which protect and restore watershed resources and water quality, maintain reduced pollutant loadings for the Bay and its tributaries, and restore and preserve aquatic living resources.

5.1 Education and Outreach

5.1.1 *Make education and outreach a priority in order to achieve public awareness and personal involvement on behalf of the Bay and local watersheds.*

Approach to Implementation of the Commitment

The Bay Program's Communications and Education Subcommittee is developing a proposal to facilitate better outreach throughout the Bay watershed by using a mass media marketing based approach. This proposal would complement ongoing efforts by Virginia state agencies but also calls for monetary participation.

The Local Government Advisory Committee and its Virginia delegation are working to improve two-way communications between the Bay program and local governments through the establishment of the BAYLOGIN web-site.

All participating state agencies have programs in place to inform and involve the program in their Bay related efforts. Websites, brochures, watershed posters and videos are among the many tools available and being used. Those aspects of Virginia Naturally geared toward adult audiences also work to meet this commitment.

Role of the State

State government participants include: CBLAD, DCR, DEQ, DGIF, MRC and VCE.

With other commitments in this section (5.0) dealing directly with formal education, this particular commitment focuses on mass media outreach and education of the general public at large. As the entity with the most direct link between the Bay Program partnership and the citizens of Virginia, the state has a critical role in making outreach a priority in order to facilitate public awareness and personal involvement.

Major examples of the many activities carried out by the state are the following:

- In January 2000, Governor Gilmore launched a statewide environmental education initiative, *Virginia Naturally*, to link Virginians to the lifelong learning and stewardship on the environment. The program is now the Commonwealth's official environmental education initiative and includes an active network of 270 partners working on environmental education and nearly 1,000 individuals. Partner organizations include all levels of government as well as business and community groups. As a result of Virginia Naturally's success, the Commonwealth created the

Virginia Office of Environmental Education at DEQ. The office will continue to promote and coordinate Virginia Naturally and develop environmental education programs that meet the C2k commitments.

- Virginia natural resource agencies annually collaborate and hold the Watershed Management Conference designed to educate local government officials and members of community environmental organizations about water quality.

Progress and Outlook

This commitment was purposely left open-ended in the hopes that it would provide continuing guidance rather than prescribing a short-term action. We are seeing stakeholders in Virginia's portion of the watershed calling for more efforts to inform and involve citizens. The draft *Shenandoah-Potomac Interim Nutrient Cap Strategy* calls for a focused mass media campaign as the result of input from stakeholders in the basin. It has also been seen as one of the more positive initiatives outlined in the draft strategy.

As mentioned earlier, portions of Virginia Naturally have improved outreach as each of the state agencies has developed new materials and improved websites to increase the information available on the Bay and related watershed initiatives.

Additional Efforts

The states, as partners in the Bay Program, have done an adequate job of informing and involving targeted, affected groups of stakeholders. However, with the new commitments in Chesapeake 2000, the Chesapeake Bay Program cannot succeed, without the awareness and involvement of a much larger portion of the watershed's population. A coordinated, mass media approach will be needed to achieve this wider recognition and involvement.

5.1.2 *Provide information to enhance the ability of citizen and community groups to participate in Bay restoration activities on their property and in their local watershed.*

Approach to Implementation of the Commitment

A Bay Program task force the Chesapeake 2000 Watershed Commitments Task Force (CWiC) will coordinate developing a clearinghouse of information for citizen and community groups as well helping facilitate watershed management planning throughout the Bay watershed.

Role of the State

State government participants include: CBLAD, DCR, DEQ and VCE

Again, partnering state agencies are the Bay Program's most direct link to citizen and community groups targeted. State representatives to CWiC will provide information and assist in development of the clearinghouse of watershed information available. In addition, most of the materials and services referenced in the clearinghouse will be those

made available through state agencies. In addition, the state has been active in facilitating the development of watershed groups in the Chesapeake Bay tributary basins. Where watershed groups already exist they have become active participants in providing information and data on nonpoint source issues.

Progress and Outlook

Virginia has been a leader in facilitating the concept of watershed management. DCR has developed a number of tools to assist watershed groups. These include storm stenciling kits, Adopt-A-Stream materials, watershed posters, a watershed video, and bumper stickers. In addition watershed management training has been provided to community watershed organizations as well as funding to assist those groups.

Additional Efforts

While a number of tools have been developed that are extremely useful to communities organizing watershed organizations, delivering those tools at the grassroots level is a very labor intensive activity.

5.1.3.1 *Expand the use of new communications technologies to provide a comprehensive and interactive source of information on the Chesapeake Bay and its watershed for use by public and technical audiences.*

Approach to Implementation

At the CBP level the basic approach is to develop and implement memoranda of understanding and other mechanisms between the Bay Program and its partners to provide information in a common format.

Role of the State

All state agencies and institutions that have relevant information are or will be participants in meeting this commitment.

Most of the Bay and water quality and general environmental education (EE) programs, products and services that are available to Virginians have been compiled into a searchable on-line database, one of the most state comprehensive catalogs in the country. The Virginia Naturally web site <http://www.vanaturally.com> is a "seamless" collaboration of state and private groups that features a searchable calendar of educational events, stewardship opportunities and numerous educational resources. The web site also provides a framework for a virtual network of partners to share information and to communicate regularly and inexpensively with each other by mail.

In addition, local governments have a new website (www.BayLogin.org) that will greatly opportunities for interaction and technical information exchange relating to their activities which help implement the new agreement. (See assessment 5.2.6 for additional information on this new website and its expected role.)

The state will support this commitment by making all pertinent data available through the Chesapeake Bay Program's Chesapeake Information Management System (CIMS). The Bay Program webmaster then takes appropriate information and makes it available to a more general audience through the CBP website, www.chesapeakebay.net.

Progress and Outlook

All involved state agencies have a CIMS Memorandum of Understanding or other mechanism in place to make sure information is being prepared in a CIMS compatible format.

Additional Efforts

The tracking of new commitments, particularly progress toward meeting our water quality commitments, will lead to the creation of volumes of new data.

5.1.3.2 By 2001, develop and maintain a web-based clearinghouse of this information specifically for use by educators.

Approach to Implementation

The CBP will be funding a FY 2001 project under the Communications and Education Subcommittee to have a web-based educational clearinghouse developed. The project was bid through a CBP request for proposal. The Virginia Institute of Marine Science was the successful bidder and is in the process of developing the site.

Role of the State

State government participants include: DCR, DEQ, DGIF, DOE and VIMS

Support the efforts of the CESC in developing this clearinghouse through participation on the subcommittee's Education Workgroup.

Progress and Outlook

The project was initiated in May 2001 with phase one completed November 1, 2001. This version will undergo a peer review by teachers and will be updated and enhanced through April, 2003.

Additional Efforts

The CESC will seek funds to maintain the site through the CBP budget process.

5.1.4 Beginning with the class of 2005, provide a meaningful Bay or stream outdoor experience for every school student in the watershed before graduation from high school.

Approach to Implementation of the Commitment

Education staff at the natural resources agencies, the state museums, and the Department of Education will implement a coordinated plan for integrating meaningful watershed

field experiences in the public school program statewide. This includes formal communication of pertinent information to school divisions; integration of related topics within appropriate SOL educator workshops; presentations at teacher conferences; public television, satellite, and other electronic training broadcasts; and meetings with school division leaders. New supplementary curriculum materials will be developed and used in conjunction with existing high-quality resources to promote meaningful watershed field experiences across grade levels. In-depth leadership training for school division representatives is tentatively planned to build local capacity to meet the objective

Role of the State

State government participants include: DCR, DEQ, DGIF, DHR, DOE, DOF, VCE and VIMS as well as the Virginia Museum of Natural History (VMNH) and the Science Museum of Virginia (SMV). These comprise most agencies represented on the Virginia Resource-Use Education Council.

The commonwealth's role in meeting this objective is to provide awareness and leadership training for key school division personnel, in concert with the state learning standards, to implement meaningful watershed field experiences for public school students statewide.

Progress and Outlook

Anecdotal evidence suggests that many public schools are already partially meeting the intent of this objective via locally developed programs, especially those supported with existing state funding (MRC and DCR provide funding to the Chesapeake Bay Foundation) for watershed field experiences. Other sources of information such as soil and water conservation district education programs also are of assistance.

Additional Efforts

Meeting this objective by June 2005 will require a sustained implementation, including materials development, teacher training and professional development, awareness of successful models at various grade levels, close correlation with the Standards of Learning, and enhanced building and central office administrative support.

5.1.5 Continue to forge partnerships with the Departments of Education and institutions of higher learning in each jurisdiction to integrate information about the Chesapeake Bay and its watershed into school curricula and university programs.

Approach to Implementation of the Commitment

With the Executive Council's 1998 signing of Education Directive 98.1, the Departments of Education of the CBP's signatories committed to become active partners in the Chesapeake Bay Program. The program's Communications Subcommittee became the Communications and Education Subcommittee with the addition of an Education Workgroup. From its inception, this workgroup has recognized Bay and watershed messages in the curricula of the public school systems as a leading priority. This priority

crystallized with the signing of Chesapeake 2000 and its meaningful experience commitment (5.1.4).

Role of the State

State government participants include: DCR, DEQ, DOE, DGIF, DHR, DOF, SMV, VCE, VIMS and VMNH.

The Commonwealth's role in meeting this objective is to continue as an active partner in the Chesapeake Bay Program, primarily through participation in the Communication and Education Subcommittee. The commonwealth will continue to support the program and the subcommittee's work as it develops strategies for more closely working with state institutions of higher learning to integrate Bay and watershed data in university programs. The new state Office of Environmental Education will coordinate interagency efforts.

Progress and Outlook

A number of DOE staff have been extremely active in the CBP with one staff member serving as chair of the Education Workgroup for two years. Virginia was also host of the first Bay Program Education Summit that was held in September 1999. Virginia DOE staff provided leadership in developing a document that defines a meaningful outdoor watershed experience as being more than a one-time event but as an element of integrated Bay and watershed curricula. This concept has been adopted by the Education Workgroup and guides efforts to meet commitment 5.1.4. Because of the importance of this commitment and its 2005 due date, it has been the priority for the workgroup. In Virginia, the definition and criteria developed for a meaningful outdoor watershed experience supports the Science Standards of Learning.

Additional Efforts

Key leaders from the institutions of higher education who are instrumental in teacher education programs will be identified and invited to become involved in the Education Workgroup. Participation of higher education faculty will assist in forging partnerships with institutions of higher education. In addition information on the education bullets (5.1.4, 5.1.5, 5.1.6) will be provided to the science and science education faculty in the institutions of higher education.

5.1.6 Provide students and teachers alike with opportunities to directly participate in local restoration and protection projects, and to support stewardship efforts in schools and on school property.

Approach to Implementation of the Commitment

The natural resources agencies, the state museums, and DOE will coordinate ongoing mailings, informational meetings, workshops, and electronic communications sharing information about watershed monitoring, protection, and restoration programs suitable for student and teacher involvement.

Role of the State

State government participants include: CBLAD, DCR, DEQ, DGIF, DHR, DOE, DOF, SMV, VCE, VIMS, and VMNH. These comprise most agencies represented on the Virginia Resource-Use Education Council.

The Commonwealth's role in meeting this objective is to ensure that key school personnel and school division central office contacts have current information about the various watershed monitoring, protection, and restoration programs that can involve teachers and students both at school sites and in the community.

Progress and Outlook

Information about school- and community-based watershed stewardship programs and activities has been made available by state agencies and their other public and private partners through the Virginia Naturally initiative, mailings, teacher workshops, and various professional meetings. A continued and systematic effort will be conducted at the beginning of the 2001-2002 school year through mailings, electronic broadcasts, professional meetings, and informational sessions. Exemplary stewardship programs will continue to be highlighted via the Virginia Naturally School Site Recognition Program to serve as models for other schools. Portfolio summaries of the four Chesapeake Bay model high school projects will also be made available.

Additional Efforts

Meeting this objective will require ongoing communication and training sessions with key school division personnel and classroom teachers.

5.1.7 By 2002, expand citizen outreach efforts to more specifically include minority populations by, for example, highlighting cultural and historical ties to the Bay, and providing multi-cultural and multi-lingual materials on stewardship activities and Bay information.

Approach to Implementation of the Commitment

The Chesapeake Bay Program has established an Environmental Justice Task Force to coordinate this and other commitments. The task force has developed specific strategies for short-term efforts to initiate better minority outreach. The Communications and Education Subcommittee is working with the EJTF to incorporate these strategies into their current outreach efforts.

Role of the State

The number of state agencies involved in this process will increase as the task becomes better defined. Currently several agencies are involved in decisions involving strategies and materials needed by participating on the CBP's Environmental Justice Task Force and Communications and Education Subcommittee.

Progress and Outlook

If minority outreach is to be effective and ongoing, it needs to be incorporated into the Bay Program's overall outreach plan, with special attention paid to the appropriate

messages and vehicles for delivering those messages to minority populations. This is being addressed as part of a public perception survey being developed now by the CESC.

Additional Efforts

The state will use the results of the perception survey in reviewing all of its Bay related information strategies and materials with particular emphasis on needs in reaching minority populations.

5.2 Community Engagement

5.2.1 Jurisdictions will work with local governments to identify small watersheds where community-based actions are essential to meeting Bay restoration goals—in particular wetlands, forested buffers, stream corridors and public access and work with local governments and community organizations to bring an appropriate range of Bay program resources to these communities.

Approach to Implementation of the Commitment

This commitment is already underway in most localities and watersheds. Local governments in partnership with conservation groups, civic organizations through Watershed forums (e.g., WCRs) have been working to involve local citizens in watershed restoration, enhancement and awareness initiatives. The Rappahannock River Basin Commission is the one legislatively created coordinating body that has been created to date and which can serve a function similar to the WCRs.

Role of the State

State government participants include: CBLAD, DCR, DEQ, DGIF and DOF

Virginia's primary role is to provide guidance and support to local governments on Bay Program issues and foster community based watershed activities. The jurisdictions will serve as the primary conduit for technical and financial assistance to local governments on bay related issues.

Progress and Outlook

Community based environmental organizations in coordination with local government and state agencies have proven most effective in identifying restoration goals based on unique conditions of the watershed in which they are active. With proper coordination of efforts and communication of these efforts to local citizens, the cooperative networks (watershed forums) can become a major Bay Program resource to their communities. In most watersheds this network is being facilitated through the WCR. DCR also is developing a web-page to provide citizens information about local watershed based initiatives.

Additional Efforts

State agencies, along side the localities, will need to foster increased awareness of water quality initiatives under way in the watersheds. Initiatives such as placing signs

signifying water quality studies (i.e., "Total Maximum Daily Load (TMDL) Study Area"), environmental monitoring, restoration projects or other environmental improvement activities can create increased interest and awareness for its citizens. Further, increased recognition of the groups that are actively participating in the activities is needed.

5.2.2 *Enhance funding for locally based programs that pursue restoration and protection projects that will assist in the achievement of the goals of this and past agreements.*

Approach to Implementation of the Commitment

Every avenue to fund and sustain locally based programs is being investigated. Currently, limited resources are available to accomplish the restoration and protections goals set forth in *Chesapeake 2000* and past agreements. Consequently, efforts are underway to maximize state, local and non-profit resources along with existing and future federal resources.

Role of the State

Virginia's natural resource agencies are responsible for coordinating the overall effort of sustaining locally driven programs and projects relative to the new agreement. Virginia will seek to secure funding for such programs and assist organizations in program development and project completion. Under the Water Quality Improvement Act, DCR funds a variety of small watershed restoration and pollution reduction projects.

Progress and Outlook

A comprehensive matrix of available state, federal and non-profit funding sources has been developed and is being disseminated to interested stakeholders. However, lack of funding and staffing resources can severely limit future progress of this commitment.

Additional Efforts

A complete and coordinated matrix of overlapping and complementary programs and initiatives needs to be completed in order to properly solicit and allocate available funding. The most critical aspect of this goal is assuring the sustainability of the locally based programs and insuring that sufficient resources are available to maintain viability of the projects.

5.2.3 *By 2001, develop and maintain a clearinghouse for information on local watershed restoration efforts, including financial and technical assistance.*

Approach to Implementation of the Commitment

The Bay Program subcommittees are coordinating with CWiC to develop a Bay wide clearinghouse. The commitment is currently being met on a smaller scale by way of local planning district commissions or other multi-jurisdictional commissions or forums via Internet sites and list servers; this however is not well coordinated. In addition to local clearinghouses the Chesapeake Bay Program currently has an online information system. The Chesapeake Information Management System (CIMS) is a clearinghouse of

publications, reports, fact sheets, and special interest studies in the Chesapeake Bay and tributaries.

Role of the State

Virginia will continue to support and provide coordination where feasible to local clearinghouse efforts, contribute to CIMS and actively participate in the relevant Bay Program subcommittees.

Progress and Outlook

Virginia agencies are documenting projects, tracking progress and calculating nutrient reductions. The successful maintenance of this effort requires expansion of existing state agency GIS and data collection staff and coordination with the Bay Program to ensure that the data gathered is consistent with other jurisdictions.

Additional Efforts

Additional resources at state and local levels will be needed. Data standards must be established to assure consistency and transferability. Capability to effectively track NPS pollution and reductions does not yet exist in most local governments, and systems among local governments are not compatible with each other and state systems. Local governments will require substantial funding to establish this infrastructure. State government systems also are minimal and require expansion to address the various needs of C2K.

5.2.4 *By 2002, each signatory jurisdiction will offer easily accessible information suitable for analyzing environmental conditions at a small watershed scale.*

Approach to Implementation of the Commitment

There has been limited progress by state agencies, as these data sources are not well integrated. Work is underway to coordinate and integrate overlapping data collection.

Role of the State

This is an evolving task at the state level. Virginia agencies are working to increase coordination among their respective data systems and to make it accessible and useful for small watershed efforts.

Progress and Outlook

Establishment of an effective data base on local watersheds will require the development of consistent informational systems at both state and local governments, and data-sharing. This is a complex task, which will take new resources. Partial utilization of existing EPA databases and web page resources is anticipated.

Additional Efforts

Achieving this commitment may not be practical given its high cost. Maryland has developed a limited yet functioning system, however this has taken several years. Virginia could evaluate it for content and design. Much of the needed information is available, although not comprehensively compiled. Additional financial and staffing

resources will be needed to compile existing data, collect data to address the gaps and update old data. Once this information is compiled, permanent staff resources will be required to implement activities at a small watershed scale. Implementation efforts using this data should be coordinated with existing locally driven, basin wide watershed organizations.

5.2.5 *Strengthen the Chesapeake Bay Program's ability to incorporate local governments into the policy decision making process. By 2001, complete a reevaluation of the Local Government Participation Action Plan and make necessary changes in Bay program and jurisdictional functions based upon the reevaluation.*

Approach to Implementation of the Commitment

Mechanisms are in place through existing state programs, watershed forums and the CBP's Local Government Advisory Committee (LGAC). It is the intent to maximize these avenues to engender greater participation.

Role of the State

State government participants include: CBLAD, DCR and DEQ

Virginia natural resources agencies will serve as the primary avenue through which financial, technical and educational resources are developed and delivered to the localities. Further, agencies will continue to actively participate on relevant Bay Program committees.

Progress and Outlook

Virginia agencies have the necessary contacts with localities to implement this commitment. Mobilizing these contacts will involve strengthening stakeholder groups to help shape the LGPAP to ensure it is effective. The LGPAP also needs to be crafted with Implementation Committee involvement, as a joint project.

Additional Efforts

Currently, local government input is not well integrated into CBP activities and decisions. Additional grant funding for localities is needed to assist in offsetting their efforts in this process (travel, etc). This can be further enhanced through the local government participation with planning district commissions, basin wide watershed organizations (councils, forums and roundtables), and other opportunities for communication, consultation and coordination.

5.2.6 *Improve methods of communication with and among local governments on Bay issues and provide adequate opportunities for discussion of key issues.*

Approach to Implementation of the Commitment

The watershed forums, soil and water conservation districts, the one basin commission in the Bay watershed and planning district commissions, are the major avenues through which local governments can be represented and informed on Bay issues.

The Local Government Advisory Committee (LGAC) of the CBP recently launched an important new website: www.BayLogin.org. The website is anticipated to be an important tool to enhance and foster new communication between local governments and the Bay program. While there are limitations to internet-based applications, Bay LOGIN services such as news flashes, newsletters, queries, surveys, archives, and links will enhance the ability of local governments to participate in Bay watershed activities and decisions.

The CBP, in cooperation with LGAC, will develop for all CBP task forces and workgroups a checklist that outlines positive actions that should be undertaken to meet the spirit of intergovernmental cooperation outlined in the new agreement and the draft revision of the CBP Local Government Participation Action Plan. This will ensure that task forces and work groups are aware of the goals of the LGAP and that they have a meaningful way to determine whether they are helping to implement its goals.

Role of the State

State government participants include: CBLAD, DCR and DEQ

The State needs to support the development of the CBP “tool kit” and other resources, including electronic transmission capabilities, to improve state delivery of CBP message to local governments. CWiC is the current CBP entity overseeing this effort. Further, greater emphasis needs to be placed on watershed forums from state policy-makers.

Progress and Outlook

It is recommended that existing avenues of established communication with localities be used to foster increased locality participation in CBP activities and decisions. Additional support is needed for locally driven basin wide watershed organizations. The Annual Watershed Management Conference has also proven to be an effective mechanism for enhancing communication education with and among local governments.

Additional Efforts

Funding to equip local governments with the infrastructure needed to carry out C2K and CBP initiatives.

5.2.7 By 2001, identify community watershed organizations and partnerships. Assist in establishing new organizations and partnerships where interest exists. These partners will be important to successful watershed management efforts in distributing information to the public, and engaging the public in the Bay restoration and preservation effort.

Approach to Implementation of the Commitment

Both Virginia and the CBP have committed extensive effort to this process. Existing community watershed organizations were identified through a comprehensive survey completed by the CBP's Community Watershed Task Force. This data is being used to strengthen local partnerships and forward the watershed management efforts. Further, basin wide organizations have been formed in each watershed to undergird the network of local organizations and foster communication, consultation and coordination among the stakeholders.

Role of the State

State government participants include: CBLAD and DCR

Virginia is working closely with existing watershed organizations and encouraging the development of new organizations where interest exists. To support, this effort tools are being developed, in cooperation with the CBP to sustain community watershed organizations. DCR offers training to watershed management organizations, and is enhancing its database about these organizations to improve the state's commitment to grass-roots environmental interests.

Progress and Outlook

Watershed forums identify localized, small watershed scale, interest and foster the development of action by those interests. The basin wide Roundtables serve as umbrella organizations and networks for the small groups.

Additional Efforts

Virginia will continue its efforts in creating and maintaining existing partnerships. Additional tools and resources will be needed as conditions warrant.

5.2.8 By 2005, identify specific actions to address the challenges of communities where historically poor water quality and environmental conditions have contributed to disproportional health, economic or social impacts.

Approach to Implementation of the Commitment

Existing programs include funding loan opportunities and community development block grants.

Role of the State

A number of state agencies are working together to evolve an approach to this commitment. In particular, the state will be determining how to relate this commitment to work proceeding and planned for the Elizabeth River, which is one of three toxic contaminants "areas of concern" designated by the Chesapeake Bay Program.

Progress and Outlook

This commitment requires a coordinated effort to identify parameters of comparison.

Additional Efforts required

Additional resources will be needed at the basin level to collect and analyze data and identify and implement resulting actions.

5.3 Government by Example

5.3.1 *By 2002, each signatory will put in place processes to:*

- 1. Ensure that all properties owned, managed or leased by the signatories are developed, redeveloped and used in a manner consistent with all relevant goals, commitments and guidance of this Agreement.***
- 2. Ensure that the design and construction of signatory-funded development and redevelopment projects are consistent with all relevant goals, commitments and guidance of this Agreement.***

Approach to Implementation of this Commitment:

To the extent possible this commitment will be met through existing state processes and requirements. A review will be conducted to determine if additional efforts would be appropriate.

Role of the State:

This commitment applies to all state agencies and institutions which have properties and which provide funds for development and redevelopment projects.

Progress and Outlook:

State agencies already are under numerous requirements to carry out their missions in an environmentally sensitive manner. To some considerable extent, this commitment is being met through two state environmental review processes; one for Virginia Department of Transportation projects and one for all other state property projects that pass the cost thresholds of \$250,000 for renovations and \$500,000 for new construction. Additional stewardship guidance consistent with the Agreement is provided by several state executive orders including those for pollution prevention, riparian forest buffers and conservation treatment of state-owned agricultural lands.

State staff are participating in the development of implementation strategies for many of the commitments. Those efforts will help inform the review that is to be conducted.

Additional Efforts

Until the review is completed it is premature to speculate on specific additional efforts that might be required. However, if meeting the commitment were to require significant additional tracking and coordination activities, then additional resources would be needed. If significant additions were to be made to the environmental requirements that major state projects and state funded projects must meet the additional resources needed might be considerable.

5.3.2 *Expand the use of clean vehicle technologies and fuels on the basis of emission reductions, so that a significantly greater percentage of each signatory government's fleet of vehicles use some form of clean technology.*

Approach to Implementation of the Commitment:

The basic approach of the state to this commitment is to continue work toward compliance with the Environmental Policy Act requirement on alternative fuels.

Role of the State:

The Department of General Services manages this program for the Commonwealth.

Progress and Outlook:

The state is complying with the requirement of the Energy Policy Act to go through a phased replacement process whereby 75% of vehicles purchased for use in the areas affected by the Act will be capable of operating on an alternative fuel. Since 1998 the state has been purchasing Alternative Fuel Vehicles (AFVs) which are powered by both gasoline and natural gas

Additional Efforts

At the national level improvements need to be made in the utility of generally available alternative fueled vehicles. Within the Commonwealth improvements in the number, distribution and accessibility of natural gas fueling sites would make it more likely that the use of the AFVs in the natural gas mode would increase.

5.3.3 *By 2001, develop an Executive Council Directive to address stormwater management to control nutrient, sediment and chemical contaminant runoff from state, federal and District owned land.*

Approach to Implementation of the Commitment:

A special task group was assembled to develop a directive for consideration by the Chesapeake Bay Program's Implementation Committee, Principals' Staff Committee and, finally, the Executive Council. The task group was composed of representatives of the Chesapeake Bay agreement signatories and other interested parties.

Role of the State:

State government participants included: CBLAD, DCR, DEQ, DGS and VDOT

While the task group was a CBP effort, a Virginia staff person chaired the group and staff of other state agencies participated as well.

Progress and Outlook:

In December the Executive Council of the Chesapeake Bay Program signed Directive No. 01-1, *Managing Storm Water on State, Federal and District-owned Lands and*

Facilities. The directive took effect immediately. The directive contains guidance on actions to be taken in six areas related to storm water management:

- Create an inventory of target public lands
- Demonstrate how to manage storm water
- Analyze the economics and effectiveness of demonstration projects
- Educate others on how to manage storm water
- Develop innovative storm water technologies
- Coordinate with communities and local governments
- Measuring progress

Additional Efforts

The adoption of the directive by the Executive Council completes this particular commitment. Implementation of the directive, of course, will be an ongoing matter.

5.4 Partnerships

5.4.1 Strengthen partnerships with Delaware, New York and West Virginia by promoting communication and by seeking agreements on issues of mutual concern.

Approach to Implementation of the Commitment:

The general approach has been to seek engagement by the non-signatory states on a very limited number of issues. The primary focus of this effort has been water quality.

Role of the State:

The state is working with the other signatories to move this commitment forward. Specific agency involvement will vary with the issue at hand.

Progress and Outlook:

The engagement of the non-signatory states in the area of water quality, primarily nutrient reduction, has been steadily improving.

A special basin-wide Water Quality Steering Committee has been established to provide management oversight for the process of integrating the cooperative and statutory nutrient reduction programs of the Chesapeake Bay and its tidal tributaries. That committee is composed of representatives from all six Bay watershed states (Delaware, Maryland, New York, Pennsylvania, Virginia, and West Virginia) the District of Columbia, EPA Region III, EPA Region II, the Chesapeake Bay Commission, the Susquehanna River Basin Commission, and the Interstate Commission on the Potomac River Basin. The primary objective of the committee is to assist with the implementation of the Chesapeake Bay Integration Process, which is designed to improve water quality sufficiently to avoid the need for the imposition of regulatory Total Maximum Daily Loads for each tributary.

Chesapeake 2000, the new Bay agreement, lays out the basic steps in the process designed to accomplish the delisting of the waters of the Chesapeake Bay and its tidal tributaries. A Memorandum of Understanding, "Cooperative Efforts for the Protection of the Chesapeake Bay and its Tributaries," has been signed by EPA, the CBC, the District and all but one of the basin states. West Virginia has not yet signed the MOU, but is an increasingly active participant on the Water Quality Steering Committee. That MOU will ensure that cooperation on the basin-wide nutrient reduction effort will be treated as a high priority by all participants.

Additional Efforts

Other opportunities for working with the non-signatory states will be identified and explored as the implementation of the numerous commitments evolves.

5.4.2 *Work with non-signatory Bay states to establish links with community-based organizations throughout the Bay watershed.*

Approach to Implementation of the Commitment:

This is an open-ended commitment that necessarily must involve various ways of making the connection with community-based organizations both in the signatory states and the non-signatory states.

Role of the State:

In terms of interaction with community-based organizations in the non-signatory states the Commonwealth largely relies on a number of efforts directly related to the CBP.

Progress and Outlook:

A number of groups within the structure of the CBP are in the early stages of developing ways to connect with community-based organizations in the non-signatory states.

The most important current connection is a major grant program has just been expanded to include community-based organizations in the non-signatory states. The Small Watershed Grants Program is in its fourth year of providing grants to community organizations and local governments. In previous years the grants had been limited to applicants in the District of Columbia, Maryland, Pennsylvania and Virginia. With last year's Congressional reauthorization of the Chesapeake Bay Program the grants have been opened up to applicants from the non-signatory states; Delaware, New York and West Virginia.

This year over \$1.5 million in Small Watershed Grants was awarded to 59 community organizations and local governments across the entire Bay watershed. The grants support the development and implementation of watershed management plans and encourage innovative, local programs that improve water quality and restore important habitats within the Bay basin. Of the total of 59 grants, 20 were awarded in 2001 to Virginia recipients.

The grant program is managed by the National Fish and Wildlife Foundation and is not under the direct control of the Chesapeake Bay Program. Instead, a CBP advisory team works with the NFWF each year to determine the general grant selection criteria and provides the NFWF with recommendations as to which applications should be funded. The awards of the NFWF have tracked those recommendations.

Additional Efforts

State staff will continue to participate in the grant application review process. Efforts to inform potential Virginia applicants will be continued.

PART TWO

VIRGINIA'S TRIBUTARY STRATEGY PROGRAM

I. Overview

A. Background

For the past ten years, Virginia has worked to develop and implement water quality plans, known as tributary nutrient reduction strategies, for each main tributary river to the Chesapeake Bay, and also for the smaller creeks of the Eastern Shore. These strategies have their beginnings in the Chesapeake Bay Program and the scientific research that identified excess nutrients (nitrogen and phosphorus) as the greatest water quality problem faced by Chesapeake Bay and its tributaries.

Virginia's tributary strategies are based on a cooperative, rather than regulatory, approach to restoring water quality. In developing these strategies, Virginia's Natural Resources agencies worked closely with local governments, farmers, conservation groups, wastewater treatment plant operators and other citizens who all have an important stake in ensuring clean water in their community. This locally-based approach helped the Commonwealth and its citizens craft tributary strategies that were rooted in practical methods and effective solutions.

These strategies are also intended to achieve equity among point sources of nutrients (i.e., wastewater treatment plants) and nonpoint sources, which include runoff from urban, agricultural and residential areas.

B. Tributary Strategy Development

The first tributary strategy to be developed was the *Shenandoah and Potomac River Basins Tributary Nutrient Reduction Strategy*, completed in late 1996. This *Strategy* was designed to achieve the 40% nutrient reduction goal agreed to by Virginia and her Bay Program partners. The *Strategy* established a template for other strategies that followed; and it also served as the major impetus for the passage of the Water Quality Improvement Act by the 1997 General Assembly. The WQIA has become Virginia's principle tool for funding and implementing the conservation practices identified in tributary strategies.

The *Shenandoah and Potomac Tributary Strategy* was followed three years later with the completion of tributary strategies for the Rappahannock River Basin and Northern Neck Coastal Basins, the York River Basin and Middle Peninsula Coastal Basins and the western portion (draining to the Chesapeake Bay) of the Eastern Shore. In addition, a final goal-setting document was completed for the James River Basin. These strategies were developed with strong local leadership and reflected the desire of involved citizens to substantially restore and protect the quality of their local waterways by 2005-2010.

Unlike the *Shenandoah and Potomac Tributary Strategy*, these strategies also included reduction goal for annual loads of sediment that enter each tributary. These goals

reflected recent scientific understanding that, in certain waters, sediment levels and resulting turbidity have as great of an impact on water quality as excess nutrient levels.

C. Status and Implementation

It is difficult to accurately track nutrient loads and reductions across an entire river basin, mostly due to the effect that climactic variability has on nonpoint source nutrient loads. However, current information indicates that Virginia has met, or is near to meeting, the 40% nutrient reduction goal in the Shenandoah and Potomac River Basin.

For the other tributary strategies, their goal deadlines range between 2005 and 2010. Progress has been made toward the nutrient and sediment reduction goals of these strategies; however, substantial further reductions will be needed in each of these basins to achieve their respective reduction goals.

D. Next Steps: Achieving Environmental Endpoints through Goal Reevaluation, Strategy Revision and Full Implementation

In 1998, the US Environmental Protection Agency placed Virginia's portion of the Chesapeake Bay and most of its tidal tributaries on the Section 303 (d) Impaired Waters List (TMDL List). As a result, Virginia and her Bay Program partners were faced with a potential overlap between a regulatory program and their ongoing tributary nutrient reduction strategies. Prior to the signing of the Chesapeake 2000 Agreement, a process was agreed upon that gave the Chesapeake Bay Program partners ten years, until 2010, to bring the main stem of the Bay and tributaries in compliance with water quality standards, before regulatory TMDL requirements would be invoked.

This effort is designed to integrate the regulatory and cooperative programs for restoring Bay water quality. As detailed in the Chesapeake 2000 Agreement, the plan is to revise existing water quality standards to more accurately reflect natural conditions and habitat variability among types of waters (and also seasons) and to determine new reduction goals that would achieve these standards for their respective locations and times.

The process, often referred to as the Chesapeake Bay Environmental Endpoints process, includes a number of steps for developing new water quality standards, as defined in the Clean Water Act. Draft Criteria for dissolved oxygen, water clarity and chlorophyll have been developed and offered to the public for review. Draft Designated Uses have also been developed which define how, where and when these criteria will apply. In conjunction with a Use Attainability Analysis, these steps will lead to revised or new State Water Quality Standards, new nutrient and sediment reduction goals and revised tributary strategies. A full discussion of this process is presented in Appendix D.

This process will take place over the next two years, requiring a major effort on the part of Natural Resources agencies, local governments, agricultural groups, conservation organizations and other parties involved with Virginia's tributary strategy initiatives. It is expected that the new nutrient reduction goals for each tributary basin will be significantly more challenging than existing goals reflected in their respective strategies.

Therefore, implementation rates required to achieve these goals by the year 2010 will be even more challenging.

II. Status Reports on Virginia's Tributary Strategies

A. Shenandoah – Potomac Tributary Nutrient Reduction Strategy

1. Tributary Strategy Development and Reduction Goals

The goal of the Shenandoah-Potomac Tributary Nutrient Reduction Strategy was to achieve a 40% reduction (relative to 1985 loads) in controllable phosphorus and nitrogen loads to the Potomac River by the end of the year 2000. This goal was shared among the Potomac River basin and all tributary basins to the north of the Potomac in the states of Maryland and Pennsylvania. This goal was established using scientific data from the Chesapeake Bay Water Quality model, which was used to predict that dissolved oxygen levels in the main stem of the Bay would improve by approximately 25% and that water quality within individual tributaries would also benefit.

2. Tributary Strategy Implementation

Development of the *Shenandoah and Potomac River Basins Tributary Nutrient Reduction Strategy* was completed in 1996. Implementation of the *Strategy* began in 1998. The non-point implementation activities were completed in December of 2000. Based on the sign-up through December of 2000 for cost-share to install nonpoint source Best Management practices, a 40.9% reduction in the annual controllable nitrogen load and a 40.7% reduction of the controllable phosphorus load were achieved.

The principal nonpoint source components of the *Strategy* included agricultural Best Management Practices and agricultural nutrient management planning. The agricultural BMP's were implemented through Virginia's Agricultural Best Management Practices Cost-Share Program, which is administered locally by Soil and Water Conservation Districts.

Nutrient Management Planning was accomplished through a combined effort of Department of Conservation and Recreation nutrient management staff, local soil and water conservation district staff and private certified nutrient management planners.

3. Interim Cap Strategy

As we approached full implementation of the *Shenandoah – Potomac Tributary Strategy*, a new strategy development process was undertaken to insure that the nutrient reductions achieved do not become eroded. This continuation of the *Shenandoah – Potomac Strategy* is termed the *Interim Nutrient Cap Strategy for the Shenandoah and Potomac River Basins*. The Departments of Environmental Quality (DEQ) and Conservation and Recreation (DCR) held joint responsibility for the development of the Interim Nutrient Cap Strategy.

The *Interim Nutrient Cap Strategy* seeks to hold the line on nutrient load levels to our Shenandoah and Potomac tributaries and sustain the water quality benefits that have been achieved. Maintaining these levels in the face of increased population growth and corresponding land use changes is the *Strategy's* main challenge. To best accomplish this objective, public participation, guidance and input was sought throughout the development of the *Interim Nutrient Cap Strategy*. As with all of Virginia's tributary strategies, this input was fostered at the local level. A public comment draft of the *Interim Nutrient Cap Strategy* was released March 30, 2001, in order to gain further public input on nutrient reduction options. This public comment draft also laid the groundwork for a number of important steps and challenges associated with the need for even greater reductions over the next decade.

The draft *Strategy* lists a number of proposed actions to slow the flow of nutrients into area waters. It also proposes developing a process to determine lines of responsibility and to track all future nutrient loads. This tracking and accounting system will be needed to accurately determine progress and achievement of future nutrient reduction goals. Each of these issues and actions will be important components of a full revision to the *Shenandoah – Potomac Tributary Strategy* that will take place in 2002 - 2003.

Three public information meetings were held in the Potomac Watershed during April and May of 2001 to review the draft and receive comments. Meetings were held on Friday, April 27 at Wilkerson's Restaurant in Colonial Beach and Tuesday, May 1 at the DEQ Northern Virginia Regional Office in Woodbridge (an afternoon meeting and an evening meeting). A public meeting was held on May 3rd in Harrisonburg to serve the Shenandoah Watershed.

The Shenandoah Pure Water 2000 Forum held several meetings with stakeholder groups presenting the *Interim Nutrient Cap Strategy* and responding to questions. Staff from DCR's Shenandoah Watershed office made presentations to several county board of supervisors and the Central Shenandoah Planning District Commission on the *Strategy* and related Chesapeake Bay 2000 commitments. Local governments in the Shenandoah Basin share a concern that rural counties will be asked to contribute a disproportionate share of nutrient reductions compared to the more urbanized counties in other regions of the Potomac basin. Comments on the *Interim Nutrient Cap Strategy* from Shenandoah stakeholders focused on a need for the emphasis to shift away from agriculture and more toward urban nutrient source reductions.

As part of the future efforts to further reduce nutrient loads in the Shenandoah and Potomac River basins, the Department of Conservation and Recreation formed "roundtables" in each of the major river basins. These roundtables were formed to ensure continued stakeholder involvement in the Commonwealth's tributary strategy initiatives.

Shenandoah Watershed Roundtable - Shenandoah Valley Pure Water 2000 Forum serves as the watershed roundtable for the Shenandoah watershed. The membership of this organization reflects the interests of business, local government, state and Federal agencies, agriculture and environmental groups.

Potomac Watershed Roundtable – Since the Potomac Watershed Roundtable was launched at the Potomac Forum on August 25, 2000, five meetings have been conducted. The Roundtable has established a number of working committees which focus on priority water quality issues that include: the nutrient cap, erosion and sediment control and stormwater management, watershed management plans, total maximum daily loads (TMDLs).

B. Tributary Restoration Strategy for the Rappahannock River and Northern Neck Coastal Basins

The *Tributary Restoration Strategy for the Rappahannock River and Northern Neck Coastal Basins (Rappahannock Strategy)* was completed and approved in August 2000. The *Rappahannock Strategy* sets nutrient and sediment reduction goals at 6.9 million pounds of nitrogen, 663,000 pounds of phosphorus, and 289,000 tons of sediment based on 1996 levels. These nutrient and sediment reductions are projected to reduce anoxic water by 50% and to increase the density of submerged aquatic grasses by 50%. Nonpoint sources account for over 90% of total nutrient loads and 100% of total sediment loads; the majority of this is a result of agricultural activities.

Total implementation costs have been estimated at \$48 million. Approximately \$39 million of that is needed for nonpoint source measures, mostly agricultural, and for technical assistance to SWCDs. During FY01, the Rappahannock basin received approximately \$1.1 million in total agricultural cost-share funds. The remaining \$9 million is needed to improve point source facilities. This funding will go to improve the Biological Nutrient Removal level of treatment at several major wastewater treatment facilities. In addition, urban sources were identified as a significant contributor of nonpoint source pollution in the Rappahannock. However, due to unknown urban BMP load reductions and associated costs, specific urban control measures and their costs were not included in the *Rappahannock Strategy*.

The Rappahannock River Basin Summit, co-sponsored by the Rappahannock River Basin Commission and the Rappahannock Conservation Council, is now in its fourth year. The Summit is well attended by state legislators and state agency personnel, local government officials and staff, Regional Commissions, SWCDs Directors and staff, and private citizens. Past Summits have centered on the development and review of the *Rappahannock Strategy*, while the 2000 Summit provided the kick off for the *Strategy's* implementation phase.

Workgroups were established during the 2000 Summit to assist in implementing the *Rappahannock Strategy*. These workgroups, which were categorized into three broad categories, Agriculture/Forestry, Urban, and Public Education and Outreach, have been meeting on a monthly basis and have identified and accomplished specific objectives related to the *Rappahannock Strategy*. The workgroups will be instrumental in revising and updating the *Strategy* in 2002 - 2003.

The 2001 Summit focused on watershed solutions and new policy initiatives that can affect and promote *Strategy* implementation and success. A major topic of this event was the relationship of the *Strategy* with ongoing Chesapeake Bay Program efforts and the current directions of the Environmental Protection Agency. It is expected that the nutrient and sediment reduction goals of the existing *Rappahannock Strategy* may have to be increased in accordance with Criteria, Designated Uses and Water Quality Standards established through the Bay Program Environmental Endpoints process.

The second year of the Rappahannock mini-grant is about to begin. The first year was successful in providing financial assistance to organizations, schools, local governments, SWCDs, Regional Commissions, and the Rappahannock River Basin Commission for a number of educational and outreach related activities associated with the *Rappahannock Strategy*. This year's funding will continue to be directed to activities related to implementation of the *Strategy*, but will also assist in implementing the Chesapeake Bay 2000 Agreement.

C. York River and Lower Coastal Basins Tributary Nutrient Reduction Strategy

The *York River and Lower Coastal Basins Tributary Nutrient Reduction Strategy* (*York Strategy*) was completed in February 2000. The *York Strategy* is aimed to achieve reductions of nitrogen by 2.3 million pounds, phosphorus by 60 thousand pounds, and sediment by 9,000 tons from 1996-97 levels. These reductions, once achieved, are projected to result in a decrease of anoxic water by 47%, and an increase of 39% in submerged aquatic vegetation (SAV) density, when compared to 1985 levels, in the York River and Lower Coastal watershed. Nonpoint sources account for approximately 80% of the nutrient loads in the watershed and 100% of the sediment load.

Costs to implement the *York Strategy* have been estimated at \$45 million through 2010, including five additional full-time personnel among the seven Soil and Water Conservation Districts (SWCD) in the watershed. Of that total, a combined \$25 million is needed for agricultural and urban nonpoint source pollution control measures and technical assistance to SWCDs. Total agricultural cost-share funds in FY01 for *York Strategy* implementation were \$737,362.

Municipal wastewater plants with a design flow capacity of one million gallons per day or more will be asked to voluntarily employ at least the Biological Nutrient Removal (BNR) level of treatment, and pollution prevention measures will be sought at industrial facilities by the Year 2010. In the past year, one point source facility in the watershed (in Hanover County) was awarded a Water Quality Improvement Fund (WQIF) grant to incorporate BNR into its design. Also, Hanover County volunteered to participate in an evaluation of all of its sewage treatment plants to determine cost-efficiency of possible BNR upgrades. A total estimated cost of \$20 million is needed to improve all significant point source facilities in the basin to the BNR level of treatment.

Representatives from several state environmental agencies, Planning District Commissions, local governments, SWCDs, and some point sources in the York and Lower Coastal watersheds regularly attend the York Watershed Forum (Forum). Implementation of the *York Strategy* is one of the focuses of the Forum. The November 2001 Forum will be the fifth in a series of eight that have been held or scheduled for the period July 2000 – June 2002. In the coming year, the Forum will develop several workgroups, each of which will focus on a specific group of water quality issues and/or programs within the basin. In connection with the Forum workgroups, a significant effort to attract additional business participation will be initiated in the coming year.

Once determined by the Bay states and the Chesapeake Bay Program, nutrient and sediment load allocations will be considered by the Forum for integration into the *York Strategy* in 2002, per the C2K Agreement. The revised *Strategy* will be the principal product of the Forum over the following year, with completion scheduled for September of 2003.

In 2002, implementation of the *York Strategy* will focus on continued progress towards increased coverage of farmland by nutrient management plans. During FY01, over 30,000 farm acres, in the York and Lower Coastal basins, were signed up for nutrient management plans for the first time, by certified private sector planners. Up to an additional 15,000 first time acres will be targeted for nutrient management plans during FY02 using grant funds. Several local erosion and sediment control programs have been reviewed this past year. Corrective actions local governments take to make their programs consistent will contribute to the goals of the *York Strategy*.

D. James River Tributary Nutrient and Sediment Reduction Strategy

In August 2000, the Virginia Secretary of Natural Resources approved the document, *Tributary Strategy: Goals for Nutrient and Sediment Reduction in the James River*. The adopted goals for the *James River Strategy* are:

- Achieve a 9% sediment reduction from the levels that existed in 1985 for the entire basin by the year 2010.
- For all areas draining directly to the tidal fresh portion of the James, Biological Nutrient Removal (BNR) implementation at point sources and an equivalent reduction in nonpoint sources by 2010. This would result in a 32% nitrogen and 39% phosphorus reduction, based on model simulation, in loading to the river from the levels that existed in 1985. Although the model simulation for this recommendation used a uniform BNR treatment level for all plants discharging to the tidal fresh portion, the overall objective is to achieve the recommended level of reduction in the aggregate point source load. This can be achieved with varying levels of nitrogen and phosphorus removal at the plants, with some operating more stringent treatment than others. This recognizes the varying capabilities and site

constraints at the plants, as well as opportunities to cost-effectively enhance treatment where feasible.

- The net nutrient loads to the lower estuary from all areas should not be allowed to increase and should be capped at 1996 levels. Growth in load coming from areas directly adjacent to the lower estuary should not exceed the reduced load coming from the tidal fresh portion of the river. The resultant zero net increase in loading to the lower estuary will prevent any degradation relative to current water quality conditions.

These goals are projected to result in an annual reduction of 13.2 million pounds of nitrogen, 2.4 million pounds of phosphorus and 180,900 tons of sediments from 1985 levels. Living resource improvements associated with the reduction goals, as projected by the Chesapeake Bay Water Quality Model, are: SAV growth in areas of the tidal fresh James previously identified by VIMS as historic SAV beds; and substantial reductions in chlorophyll levels throughout the estuary. The estimated cost for these improvements is \$164 million for point sources and \$135 million for nonpoint source BMP implementation.

The *James River Strategy* goals will be revised starting in 2002 as part of the overall Chesapeake Bay Program Environmental Endpoints process, which is producing water quality criteria for dissolved oxygen, chlorophyll, and water clarity. The criteria will be used in conjunction with the Chesapeake Bay models to estimate the additional load reductions that will be needed by major Bay tributary for nitrogen, phosphorus, and sediment. The James River Tributary Team, composed of staff from state agencies, will be re-formed to serve as the technical support team for the strategy revisions. Watershed Conservation Roundtables in the James River basin will play a vital stakeholder involvement role in the revision process.

During this reporting period, Watershed Conservation Roundtables remained active in the Upper, Piedmont, and Lower portions of the James River basin. Steering Committees composed of representatives of the Soil and Water Conservation Districts in Upper and Piedmont portions of the basin provide leadership for the Roundtables. The Hampton Roads Planning District Commission serves as the coordinator for the Lower James Watershed Roundtable. Each of the three Roundtables met several times in 2001, providing continuing opportunities for stakeholders to raise nonpoint source pollution issues of concern, and to identify potential solutions tailored to each of the distinctive regions of the basin.

E. Eastern Shore Bay Coastal Tributary Nutrient Reduction Strategy

The *Eastern Shore Coastal Basins Tributary Strategy* (*Eastern Shore Strategy*) was completed in November 1999. Since that time, the process has been underway to quantify what efforts are required to achieve the adopted goals. This includes the development and implementation of an extensive water quality monitoring program and the development of an implementation team to oversee and guide the process. The activities,

outlined herein are based on the established goal for restoring the creeks and embayments along Virginia's Eastern Shore Chesapeake Bay coastline.

1. Eastern Shore Strategy Goals

Living Resource Goal: *Increase the areas and density of Submerged Aquatic Vegetation throughout the Eastern Shore tidal creeks and embayments to historic levels to enable the return of abundant and diverse fish and shellfish populations, which in turn, will help to sustain and improve local economies.*

Nutrient Reduction Goal: *The nutrient reduction goal for the Eastern Shore Strategy has been identified as an interim goal for 2003. These reductions are linked to reasonable assurances of BMP implementation resulting in the following projected reductions by 2003: Nitrogen 22.4%; Phosphorus 41.8%; and Sediment 31.4%.*

2. Strategy Development Process

Participants in the *Eastern Shore Strategy* development process included the following local officials and stakeholders: Northampton County, Accomack County, and the 15 towns in the Bay watershed, Eastern Shore Soil and Water Conservation District, Eastern Shore RC&D, Virginia Natural Resource Agencies, Natural Resource Conservation Service, Virginia Institute of Marine Science, Virginia Cooperative Extension, Eastern Shore Planning District Commission, agricultural producers, and local environmental organizations.

This diverse team was further expanded to include local educators, individual citizens and support organizations to include Save-Our-Streams and the Alliance for the Chesapeake Bay. This expansion was necessary to address the specific educational and local involvement needs of the strategy. The team, now known as the Eastern Shore Watershed Conservation Partnership, primarily focuses on the Tributary Strategy, but also works on issues that are integrated with and ancillary to the process, thus allowing for a more comprehensive approach to restoring the coastal creeks and embayments.

3. Implementation

Implementation of the *Eastern Shore Strategy* has been divided based on the respective goals for SAV and nutrients. A comprehensive monitoring plan has been developed and approved. Implementation of the monitoring plan began in late 2000. The monitoring program, involving both contracted and citizen monitoring, is designed to establish a baseline of information on SAV health and water quality within the small creeks and embayments along the Eastern Shore's Bay coastline. Based on these findings, an action plan will be developed to restore the SAV to historical levels as feasible. Resources committed over the last two years have been dedicated to the development of the monitoring plan and its implementation.

The interim nutrient reduction goal is also a coordinated effort, primarily between conservation agencies on the Eastern Shore. The Eastern Shore Soil and Water Conservation District, through the Agricultural Cost Share program, has been aggressively implementing BMPs, which target the desired reductions. These efforts are

coordinated and complimented by the locality efforts to improve Erosion and Sediment control compliance and the Planning District Commissions efforts to coordinate implementation of the Chesapeake Bay Preservation Act.

In 2001 the Eastern Shore Watershed Conservation Partnership developed four working groups to address the core needs of the *Eastern Shore Strategy* and associated efforts. These work groups are as follows:

Eastern Shore Watershed Network: The Watershed Network was tasked with developing mechanisms to provide watershed information and data to interested stakeholders on the Eastern Shore. This effort would identify all the water quality and conservation initiatives and studies previously conducted, currently underway or proposed in an effort to minimize duplication and maximize available resources. It would further provide contact information on all active watershed conservation contributors on the Eastern Shore.

Water Quality Monitoring Team: This Team was tasked with overseeing and tracking and updating the SAV and water quality-monitoring program for the *Eastern Shore Strategy*.

Community Outreach and Education Workgroup: This Workgroup was tasked with developing activities and initiatives that would train, educate and motivate local citizens towards personal stewardship. These activities include the design and conduct of local “know your watershed meetings” across the basin. The group will also host periodic water quality workshops in coordination with the Watershed Network team.

Total Maximum Daily Load (TMDL) Workgroup: This Workgroup was tasked with assisting the state agencies on assessing, developing and implementing TMDL plans on the Eastern Shore. This workgroup is also tasked with identifying ways to remove stream reaches from the “Impaired Waters List” prior to the targeted TMDL development date.

4. Resource Needs

The long-term financial need for monitoring and BMP implementation remains at approximately \$3 million. Additional funds will be required once monitoring data is collected for modeling and SAV restoration.

5. Next Steps

The *Eastern Shore Strategy* is an ongoing process. Coordinated efforts for the *Strategy* and other water quality initiatives have been greatly enhanced with the development of the Eastern Shore Watershed Conservation Partnership and its subcommittees. Through a more coordinated approach, funding needs and implementation actions can be prioritized based on a comprehensive watershed management approach. Commitment to the Eastern Shore Watershed Conservation partnership by Virginia’s Natural Resource agencies is critical to the successful implementation of the *Eastern Shore Strategy*.

PART THREE ENVIRONMENTAL STATUS AND TRENDS INFORMATION

I. INTRODUCTION AND OVERVIEW

This section presents information about key ecological conditions in the tidal portions of the Virginia Chesapeake Bay, and its major tributaries (i.e., Potomac, Rappahannock, James, and York Rivers). The water quality conditions discussed are directly affected by the nutrient and sediment reduction strategies. These water quality conditions are represented by a combination of the current status and long-term trends for nutrients (nitrogen and phosphorus), chlorophyll, water clarity, suspended solids, and dissolved oxygen. Environmental information regarding other important conditions in Chesapeake Bay (e.g. submerged aquatic vegetation, fisheries, toxicants) will be published in January 2002 (*Chesapeake Bay and its Tributaries: Results of Monitoring Programs And Status of Resources; 2002 Biennial Report of the Secretary of Natural Resources to The Virginia General Assembly*).

The Virginia Chesapeake Bay and its tidal tributaries continue to show many environmental trends indicating progress toward restoration to a more balanced and healthy ecosystem. However, the Bay system remains degraded and some areas and some indicators show continuing degradation. Progress in reducing nutrient inputs has made demonstrable improvements and we expect that continued progress toward nutrient reduction goals, along with appropriate fisheries management and toxicant controls, will assure further improvement in the Bay's recovery. Findings from monitoring programs are highlighted below and discussed further in the following sections.

- Overall, in Virginia's portion of the Chesapeake Bay drainage area, the 2000 annual nutrient loads discharged by point sources were reduced by 56% for phosphorus and 23% for nitrogen, compared to the 1985 baseline loads.
- Based on estimates calculated by the Bay Program's Watershed Model, the 2000 annual loads from nonpoint sources were reduced by approximately 6% for phosphorus, 7% for nitrogen, and 11% for sediment, compared to the 1985 baseline loads. These are percentage reductions of the total nonpoint source loads, not just the controllable fraction of the loads.
- Phosphorus levels in water entering the Bay from the watershed are reflecting both point and nonpoint source nutrient load reductions by showing improving trends in many areas. Within the tidal waters themselves, there are also some improving trends observed and no degrading trends. Unfortunately, several improving trends in the segments of the York and Rappahannock noted in last year's annual report have leveled off such that phosphorus levels are no longer declining in these segments.

- Nitrogen levels are showing very widespread improving trends. Water entering from the watershed has decreasing nitrogen levels in most of the major tributaries. Almost every section of the tidal rivers and the Virginia Chesapeake Bay also show improving conditions.
- Levels of dissolved oxygen are improving in increasingly widespread areas of the tidal rivers. However, conditions for dissolved oxygen still remain only fair in much of the Virginia Chesapeake Bay and a few of the river segments near the Bay. The Corrotoman River is the only area indicating degrading conditions for dissolved oxygen levels.
- Water clarity, a very important environmental parameter, is generally poor and degrading in many areas near and in the Virginia Chesapeake Bay. This is probably related to high and increasing levels of suspended solids. These degrading conditions in the Virginia Chesapeake Bay may be causing degradation of zooplankton populations and are a major impediment to restoration of submerged aquatic vegetation (SAV).
- Chlorophyll levels are moderately high throughout much of the tidal waters. Several new degrading trends are evident in this reporting period and are indicative that nutrient levels, though generally improving, are still detrimentally high.

II. TRIBUTARY BASIN NUTRIENT LOADS

A. Point Sources

Table III-1 presents the annual nitrogen and phosphorus loads discharged from point sources within each of Virginia's tributary basins. The table also shows the percent change in loads when compared to the 1985 baseline.

Overall, in Virginia's Bay watershed the percent reduction for the annual point source phosphorus load between 1985 and 2000 is 56%, and for nitrogen it is 23%. In comparison to the 1999 loadings, the phosphorus load was slightly higher (182,600 lbs/yr more; only a 3% change), and the nitrogen load was also somewhat higher (288,840 lbs/yr more; just a 1% change). These modest changes are attributable to an increase of about 13.7 million gallons per day of treated discharge from the facilities tracked, as well as the addition of five municipal plants and one industrial discharge to the loading estimate.

Steady progress has been maintained in reducing point source phosphorus loads due to the phosphate detergent ban (1988) and installation of phosphorus control systems at all the major plants discharging to the tidal portions of the Bay tributaries. The nitrogen reduction effort was aided in 2000 with the start-up of biological nutrient removal (BNR) systems at several plants. Using cost-share grants from the Water Quality Improvement Fund (WQIF), the projects that came on-line included the FWSA-Opequon STP, HRRSA-North River STP, and SIL Clean Water MRRS, all in the Potomac basin.

Significant additional reductions will occur as the remainder of WQIF projects are completed over this year and into 2002. Future point source reductions in the lower Bay tributaries will result from the addition of nine facilities in the WQIF cost-share program.

Appendix E contains the 2000 nutrient load information for the individual facilities tracked in Virginia's portion of the Chesapeake Bay watershed. The tables present load data for each significant point source discharger by river basin. The list of plants is sorted by the percent reduction achieved since the baseline year, with those that have achieved the highest level of reductions at the top of each list.

Table III-1. Virginia Point Source Nutrient Loads – 2000

River Basin	Number Of Plants	2000 Phosphorus Load (lbs/yr)	Phosphorus % Change from 1985	2000 Nitrogen Load (lbs/yr)	Nitrogen % Change from 1985
Shen/Potomac	38	521,350	-32%	12,008,360	+11%
Rappahannock	13	53,660	-71%	588,070	+20%
York	8	184,220	-59%	1,220,360	-12%
James	32	1,421,040	-61%	13,614,180	-43%
Coastal	8	143,200	-57%	1,701,260	+31%
Totals	99	2,323,470	-56%	29,132,230	-23%

B. NonPoint Sources

Table III-2 presents the total annual phosphorus, nitrogen and sediment loads from nonpoint sources in each of Virginia's Bay tributary basins. The table also shows the percent change in loads when compared to the 1985 baseline. The loading estimates are results based on the Year 2000 Progress Run of Phase 4.3 of the Chesapeake Bay Watershed Model. This Progress Run accounts for implementation of all the Best Management Practices (BMPs) that are tracked through the Agricultural BMP Cost-Share Program, known urban stormwater control activities, and estimates of other voluntary, non-cost shared BMPs.

Table III-2. Virginia Nonpoint Source Nutrient Loads – 2000

River Basin	2000 Phosphorus Load (lbs/yr)	Phosphorus % Reduction from 1985	2000 Nitrogen Load (lbs/yr)	Nitrogen % Reduction from 1985	2000 Sediment Load (lbs/yr)	Sediment % Reduction from 1985
Shen/Potomac	1,660,000	10.1%	13,970,000	9.5%	720,000	14.8%
Rappahannock	880,000	18.6%	7,520,000	18.8%	330,000	21.2%
York	660,000	12.5%	6,890,000	12.1%	140,000	12.5%
James	4,500,000	1.1%	22,810,000	2.3%	1,200,000	7.5%
Coastal	200,000	9.7%	2,120,000	2.4%	20,000	0%
Totals	7,900,000	5.8%	53,310,000	7.2%	2,410,000	10.5%

III. WATER QUALITY

Monitoring of water quality conditions is vital to understanding environmental problems, developing strategies for managing the Bay's resources, and assessing progress of management practices. This section summarizes results of statistical analyses conducted on surface measurements of total nitrogen, total phosphorus, chlorophyll *a*, water clarity, total suspended solids and bottom measurements of dissolved oxygen. These parameters are measures of water quality directly effected by nutrient loading changes and in turn directly affect living resources of the Bay.

Phosphorus: Nutrients such as nitrogen and phosphorus influence the growth of phytoplankton in the water column. Elevated concentrations of these nutrients can result in excessive phytoplankton production (i.e., algal growth rate). Decomposition of the excess resulting organic material during the summer can result in low levels of dissolved oxygen in bottom waters. These low oxygen levels (anoxic or hypoxic events) can cause fish kills and drastic declines in benthic communities which are the food base for many fish populations. Anoxic waters also adversely affect fish and crab population levels by limiting the physical area available for these organisms to live in.

Figure 1 presents the current status and long term trends (1985-2000) in phosphorus concentrations. Areas of the Elizabeth, lower James, and York have the poorest conditions in relation to the rest of the Chesapeake Bay system. Other furthest downriver segments of rivers are fair but the mainstem Virginia Chesapeake Bay and the upper portions of the tidal rivers have relatively good conditions. The watershed input stations shown in figure 1 provide information about the success of nutrients control efforts in the Bays watershed. Results at these watershed input stations are flow adjusted to remove the effects of riverflow and therefore assess the effect of nutrient management actions such as point source discharge treatment improvements and best management practices to reduce non-point source runoff. The watershed input stations on the largest of VA tributaries (Rappahannock,

The terms *good*, *fair*, and *poor* used in conjunction with nitrogen and phosphorus conditions are statistically determined classifications for comparison among areas of similar salinity within the Chesapeake Bay system. Though useful in comparing current conditions among different areas of the Chesapeake Bay system, it must be remembered that these terms (good, fair, poor) are not absolute evaluations but only evaluations relative to other areas of a generally degraded system. Several major scientific studies have shown that the Chesapeake Bay system is currently nutrient enriched and has excessive and detrimental levels of nutrient and sediment pollution. Given this, it is likely that an absolute evaluation in relation to ideal conditions would indicate that most water quality parameters are currently poor throughout the whole Bay system.

The Monitoring Subcommittee of the Federal-Interstate Chesapeake Bay Program continues to develop additional methodologies for water quality status evaluations which in the future will be used in conjunction with, or possibly in replace of, the current methods.

James) show improving concentration trends (i.e., decreasing concentrations of phosphorus). The James is the only river where actual phosphorus loads (i.e. total pounds of phosphorus entering from the watershed via riverflow) have declined. This is a result of both a declining riverflow volume as well as the declining phosphorus concentration. Riverflow volume has not changed in the other rivers. The improving concentration trends are probably a result of the Phosphate detergent ban as well as best management practices for the control of non-point sediment and nutrient runoff. The watershed input of the Pamunkey indicates a degrading trend; suggesting management efforts to control phosphorus runoff have not been as effective in this basin. The problem is likely a combination of both point and non-point sources because both dissolved orthophosphorus (commonly from point sources) and suspended sediment (commonly from non-point sources) are also degrading at this station.

Decreasing phosphorus concentrations in the riverflow entering from the watershed have had widespread positive impacts on phosphorus concentrations in the tidal waters. Trends prior to 1998 indicated concentrations increasing in many areas but analyses in the last several years have found that these degrading trends were reversed and now there are widespread improving conditions for phosphorus. Of concern in this annual report is the fact that previously improving trends in tidal Mattaponi, Pamunkey, and York segments have now leveled off and are no longer present. This is due to increasing trends in dissolved inorganic form of phosphorus throughout these same segments; trends which fortunately are not present in any of the other tributaries. These increasing inorganic phosphorus trends are of concern because they may be the cause of increasing chlorophyll levels found for the first time this year in the Mattaponi, Pamunkey and downstream York segments (see figure 3).

Nitrogen: Figure 2 presents the status and long term trends (1985-2000) in nitrogen concentrations. As with phosphorus, management actions to reduce nitrogen have been effective as indicated by improving conditions at nearly every watershed input station. The major exception is the Pamunkey, where anthropogenically influenced concentrations of nitrogen are increasing this reporting period for the first time. Also as with phosphorus, the loading of nitrogen has remained unchanged in all rivers except the James, where it has declined. This is a result of both a declining riverflow volume as well as the declining nitrogen concentration. Riverflow volume has not changed in the other rivers. Management actions also have created very widespread improving trends throughout the tidal waters.

Status in the upper Potomac River and parts of the Elizabeth are worse than those found in the major southerly tributaries (Rappahannock, York, and James) or the Virginia Chesapeake Bay. Much of the Rappahannock, York, and James and Virginia Chesapeake Bay have good status relative to other Bay waters of similar salinity.

Chlorophyll: Chlorophyll *a* is a measure of the level of algal (i.e., phytoplankton) biomass in the water. High chlorophyll *a* or algal levels are an indicator of poor water quality because they can lead to low dissolved oxygen conditions when the planktonic organic material sinks into bottom waters and is decomposed. High algal levels can also

be a factor in reduced water clarity and reducing the amount of light that reaches Submerged Aquatic Vegetation (SAV).

Figure 3 presents the current status and long term trends (1985-2000) in chlorophyll concentrations. Parts of all major tributaries (Potomac, Rappahannock, York, and James) have borderline status in relation to the chlorophyll's contribution to decreased water clarity and its effect on growth of submerged aquatic vegetation. There are widely scattered segments where chlorophyll levels are degrading (i.e. concentrations are increasing) with the only improving trend in the western branch Elizabeth river. The continuing degradation and lack of improving chlorophyll levels despite the many improving nutrient conditions means that nutrient levels are still too high and further reductions will be necessary before chlorophyll levels are improved. Pamunkey, Mattaponi, and York segments have degrading trends for the first time during this annual reporting period. As noted previously, these trends are probably a result of the increasing phosphorus concentrations noted in these same segments.

Dissolved Oxygen: Dissolved oxygen is an important factor affecting the survival, distribution, and productivity of living resources in the aquatic environment. Figure 4 presents the current status and long term trends (1985-2000) in dissolved oxygen concentrations. Status of each segment is given in relation to dissolved oxygen levels supportive of living resources. About half of the Virginia Chesapeake Bay and smaller portions of the tidal tributaries have only fair status. The lower Potomac, lower Rappahannock, and northernmost Virginia Chesapeake Bay segments are indicated as poor or fair partly because of low dissolved oxygen in the bottom waters of mid-channel trenches. These mid-channel trenches naturally have lower dissolved oxygen levels and the spatial and temporal extent of low levels has been exacerbated by anthropogenic nutrient inputs. It is very encouraging that each of the last several annual reports has found new improving trends. There are now improving conditions in segments of all the major tributaries (Potomac, Rappahannock, James, and Elizabeth). The only degrading trend occurring is in the Corrotoman River.

Figure 1) Total Phosphorus Status and Trends

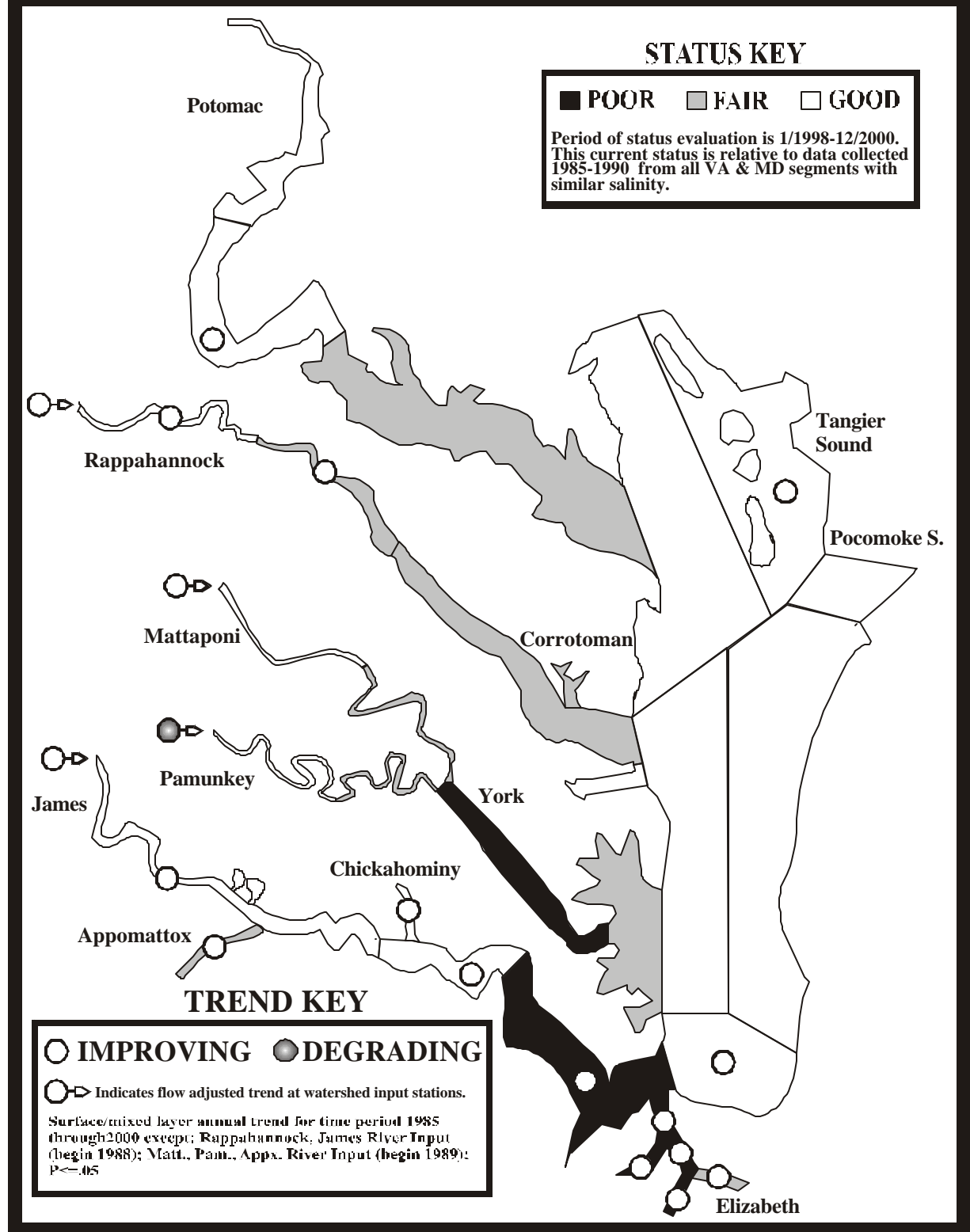


Figure 2) Total Nitrogen Status and Trends

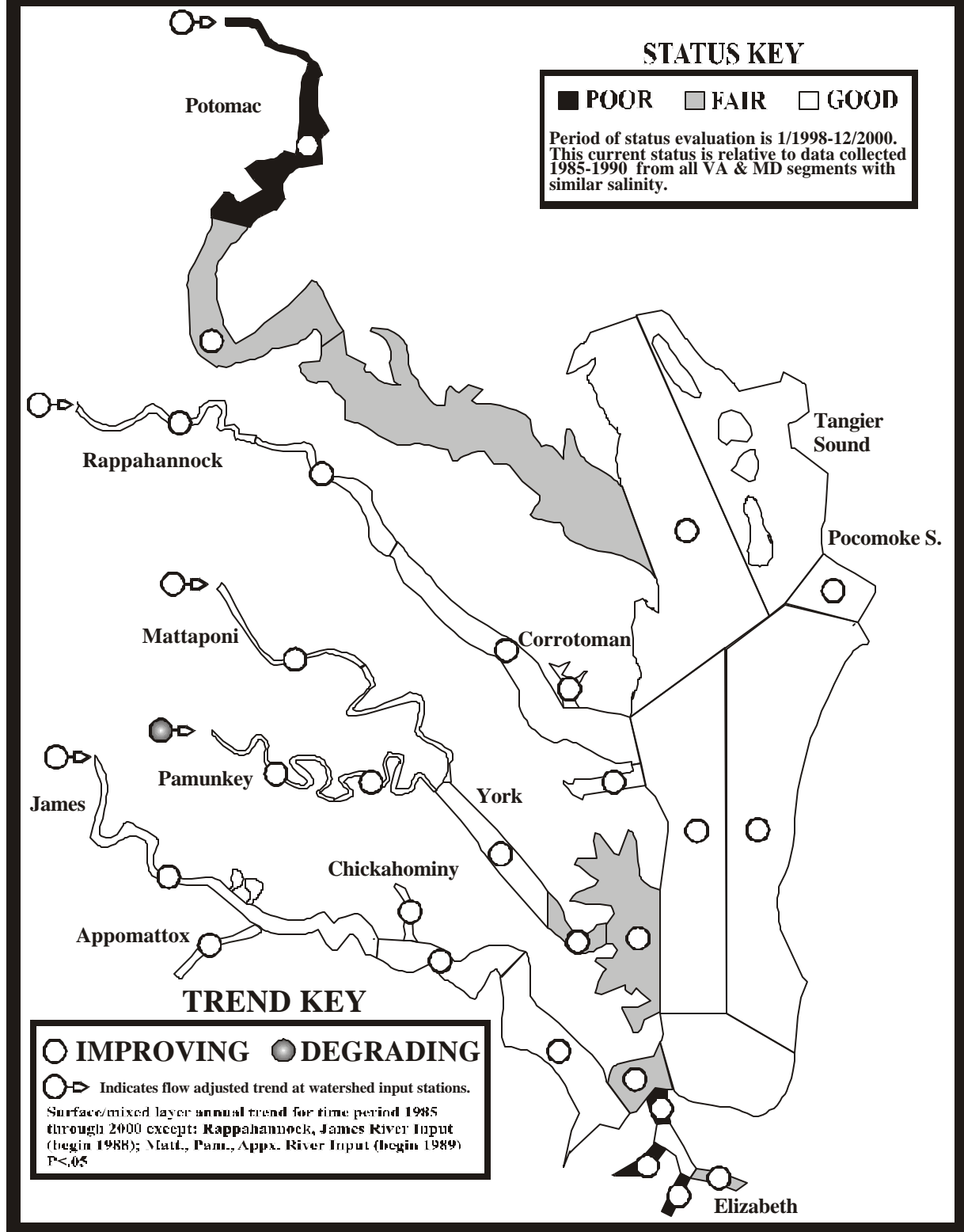


Figure 3) Chlorophyll Status and Trends

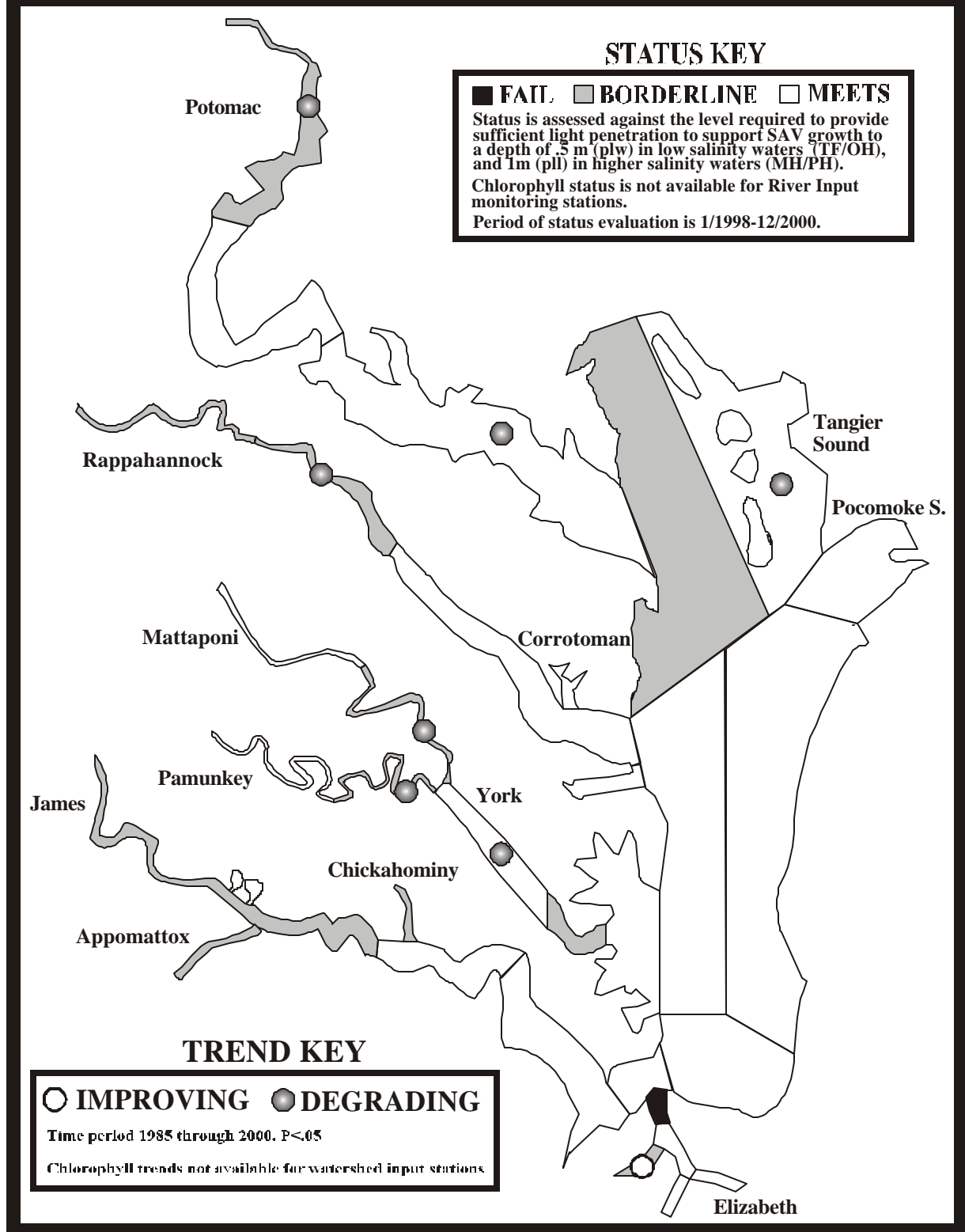
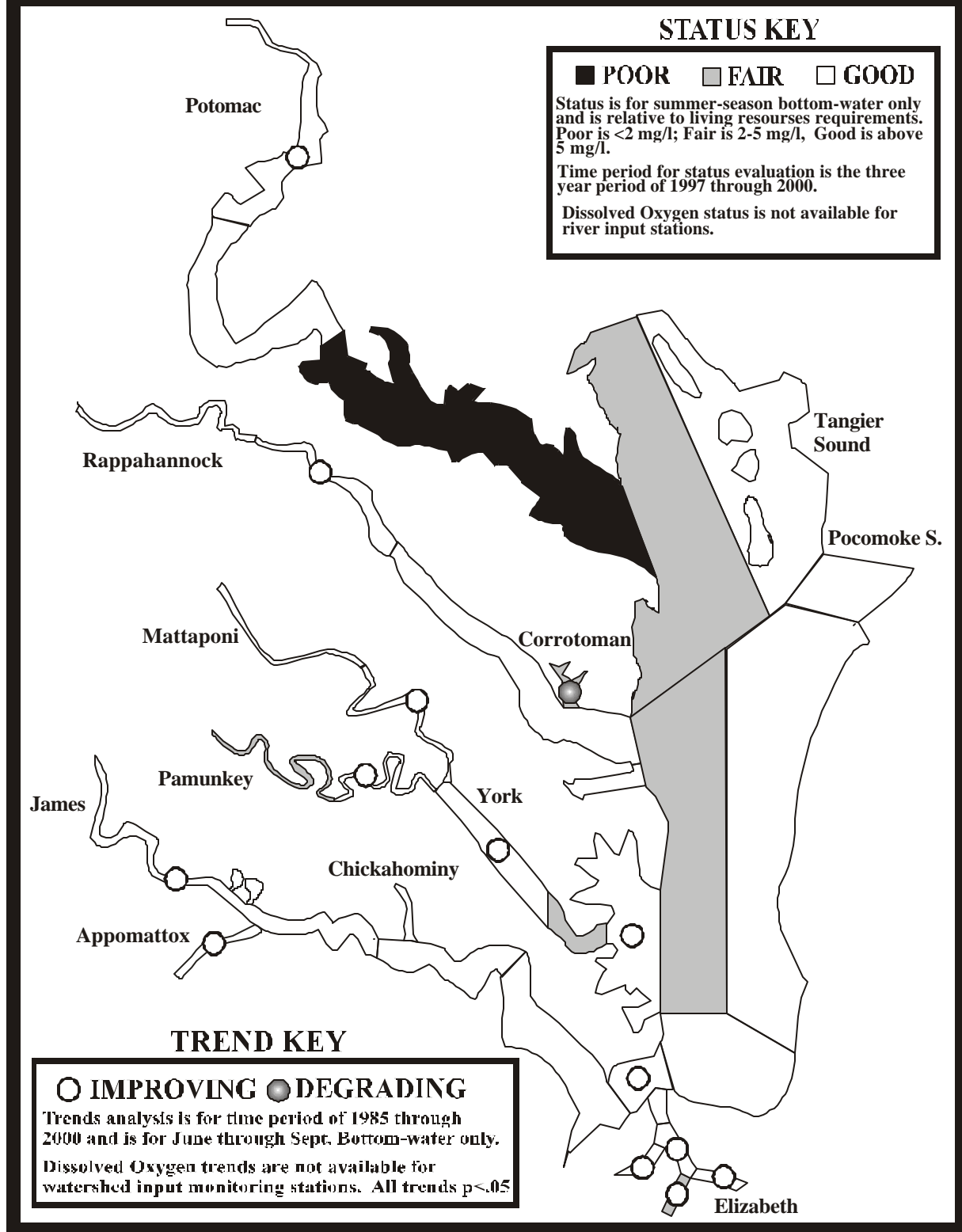


Figure 4) Dissolved Oxygen Status and Trends



Water Clarity: Water clarity is a measure of the ability of sunlight to penetrate through the water. Poor water clarity is an indication that conditions are inadequate for the growth and maintenance of submerged aquatic vegetation (SAV). Poor water clarity can also affect the health and distributions of fish populations by changing their ability to see prey or avoid predators. The major influences on water clarity are: 1) concentrations of particulate inorganic mineral materials (e.g., sand or clays), 2) concentrations of planktonic algae (i.e., phytoplankton), 3) concentrations of particulate detrital organic material (e.g., very small particles of dead algae or decaying marsh grasses), and 4) dissolved substances which color the water (e.g., brown humic acids generated by plant decay). Which of these factors is dominant can vary seasonally and spatially.

Figure 5 presents the current status and long term trends (1985-2000) in water clarity. Poor water clarity is one of the major environmental indicators of degradation in the Chesapeake Bay system and is a major factor hindering the resurgence of submerged aquatic plant growth because status is only borderline or failing the target in many segments. There are also widespread areas where further degradation of water clarity is occurring, especially in the lower tributaries and Virginia Chesapeake Bay. One of the reasons for these degrading trends is possibly the high level of riverflow in several recent years. Other possible reasons are increased shoreline erosion as a result of waterside development or even some combination of sea level rise and land subsidence.

Suspended Solids: Suspended solids are a measure of the small particulates in the water, a combination of items 1-3 listed in the above discussion of water clarity. Suspended solids directly affect water clarity for submerged aquatic vegetation and are most often the major controlling factor. Elevated suspended solids can also be detrimental to the survival of oysters and other aquatic animals. Oysters can be smothered by deposition of the material and the feeding of filter feeding fish (e.g., menhaden) can be negatively effected. In addition, since suspended solids can contain organic and mineral components containing nitrogen and phosphorus, increases in suspended solids can result in an increase of nutrients.

Figure 6 presents the current status and long term trends (1985-2000) in suspended solids concentration. Parts of all major tributaries (Potomac, Rappahannock, York, James, and Elizabeth) have segments that fail or are borderline in relation to targets to support growth of submerged aquatic vegetation. The improving trends in flow adjusted concentration at the Watershed input stations of the Potomac and Rappahannock are encouraging signs that management actions to reduce NPS sediment runoff may be having some success. However, there are several degrading trends in the tributaries and some of the Virginia Chesapeake Bay mainstem. As with water clarity, reason for these degrading trends are possibly high levels of riverflow, or tidal shoreline erosion. A previously degrading trend in Tangier Sound is no longer present in this reporting period. This is very encouraging because this area has major beds of submerged aquatic vegetation that are very important refuge and habitat for many aquatic animals.

Figure 5) Water Clarity Status and Trends

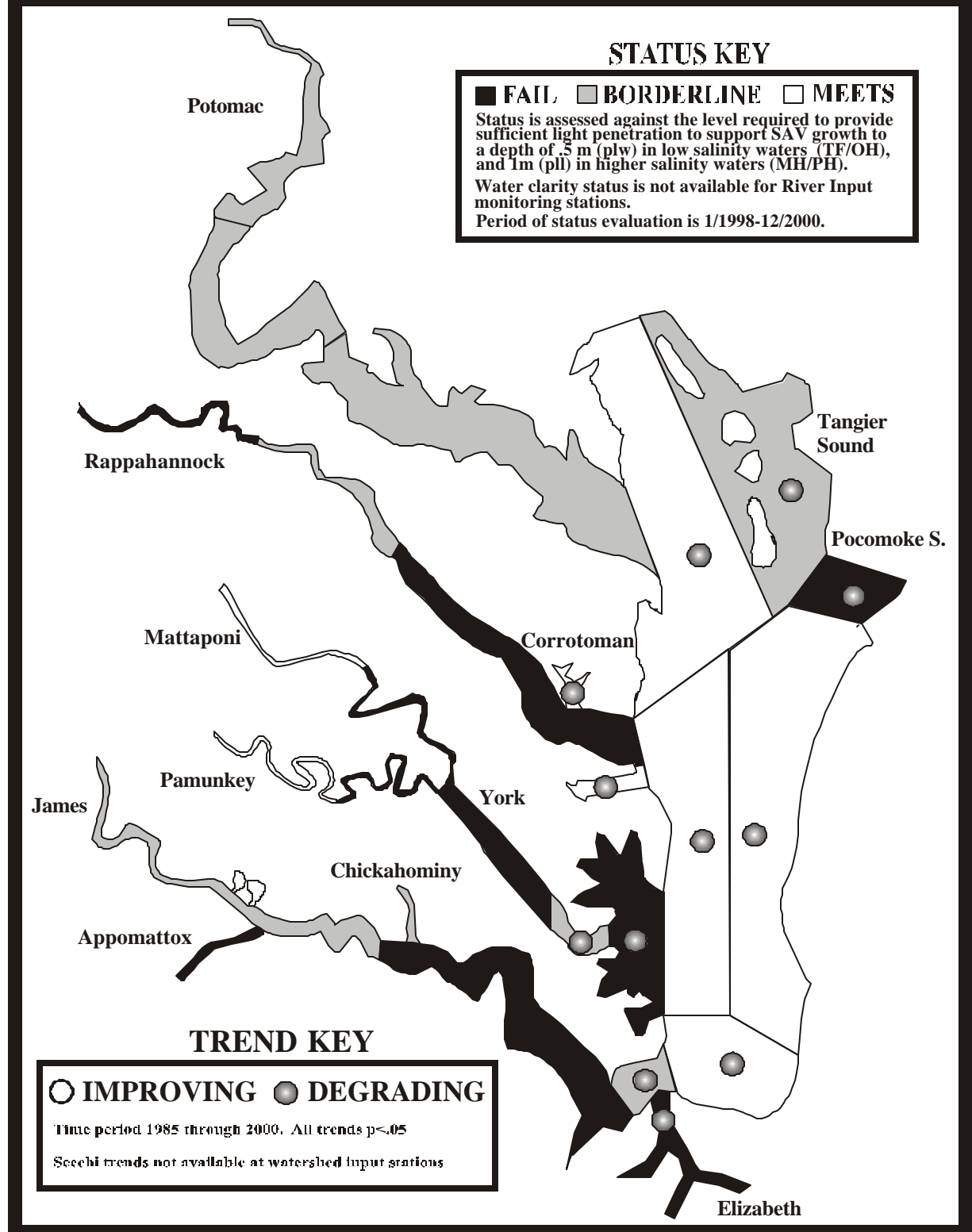
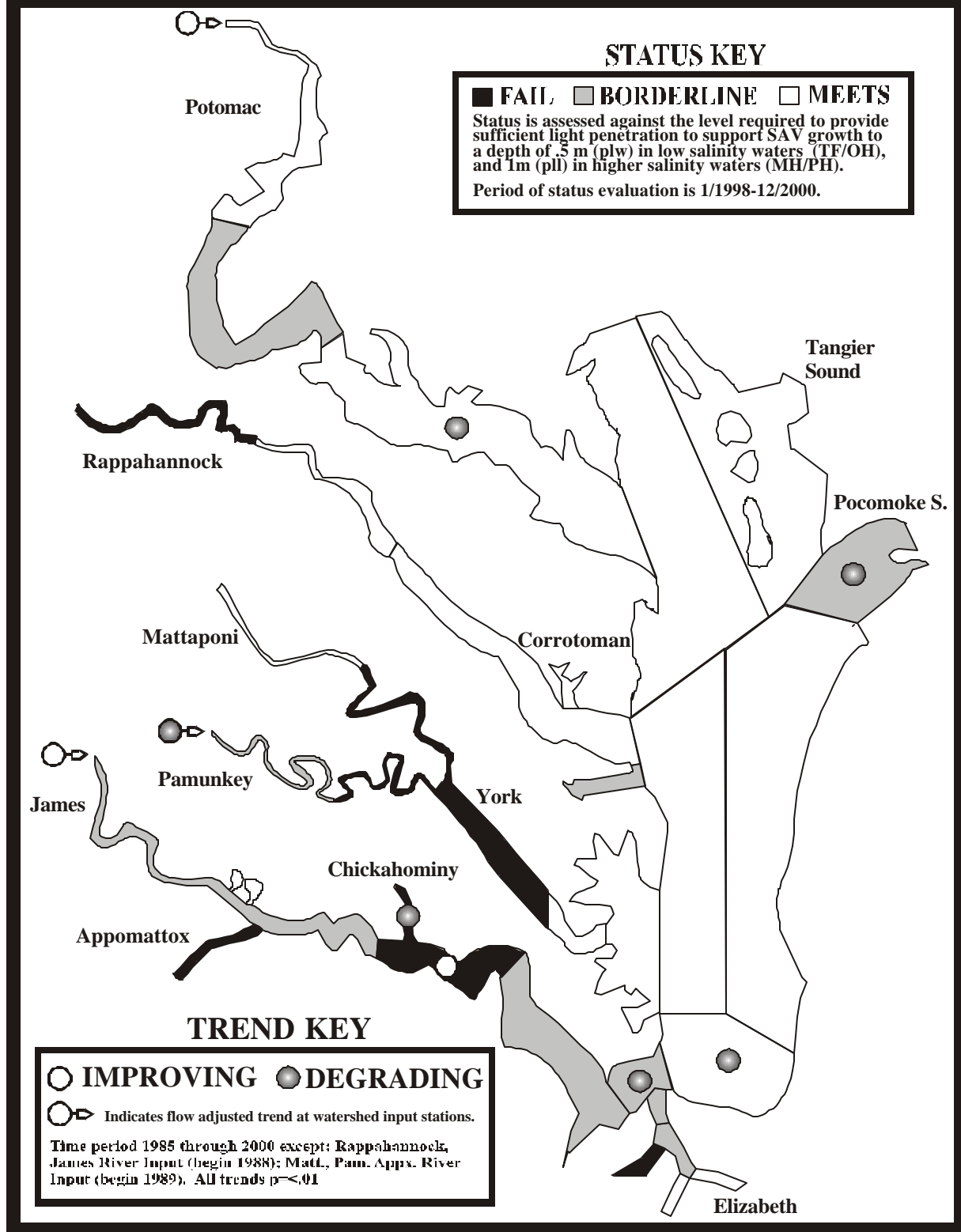


Figure 6) Suspended Solids Status and Trends



APPENDICES

Appendix A: The *Chesapeake 2000* Agreement

Appendix B: Summary of resource information for 22 subsections of the Agreement

Appendix C: Results of the local government survey regarding the Agreement

Appendix D: Water Quality "Backgrounders" (setting environmental endpoints)

Appendix E: 2000 Point Source Nutrient Load information